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Infrastructure Maintenance Management Toolkit

Volume II

Guidance on Preparing a Maintenance Management Plan for Water and Wastewater

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Abbreviations List

- ACRS = Asset Condition Reporting System
- CCP = Comprehensive Community Plan
- CISP = Community Infrastructure Services Plan
- Community of Practice = Naut'sa Mawt Tribal Council (NmTC) Housing and Infrastructure Community of Practice
- FN = First Nation
- FNIIP = First Nation Infrastructure Investment Plan
- ICMS = Integrated Capital Management System (formerly CAIS)
- ISC = Indigenous Services Canada
- LCM = Life-cycle management
- Library of Maintenance Practices & Library – a component of the Naut'sa Mawt Toolkit for preparing and implementing Community Infrastructure Services Plans (CISPs)
- Library = Library of Maintenance Practices
- KPI = Key performance indicator
- LOS = Levels of Service
- MMP = Maintenance Management Plan
- MTSA = Municipal Type Service Agreement
- NmTC = Naut'sa Mawt Tribal Council
- O&M = Operations and maintenance
- PW = Public Works or Public Works Department
- ROW = Rights of way

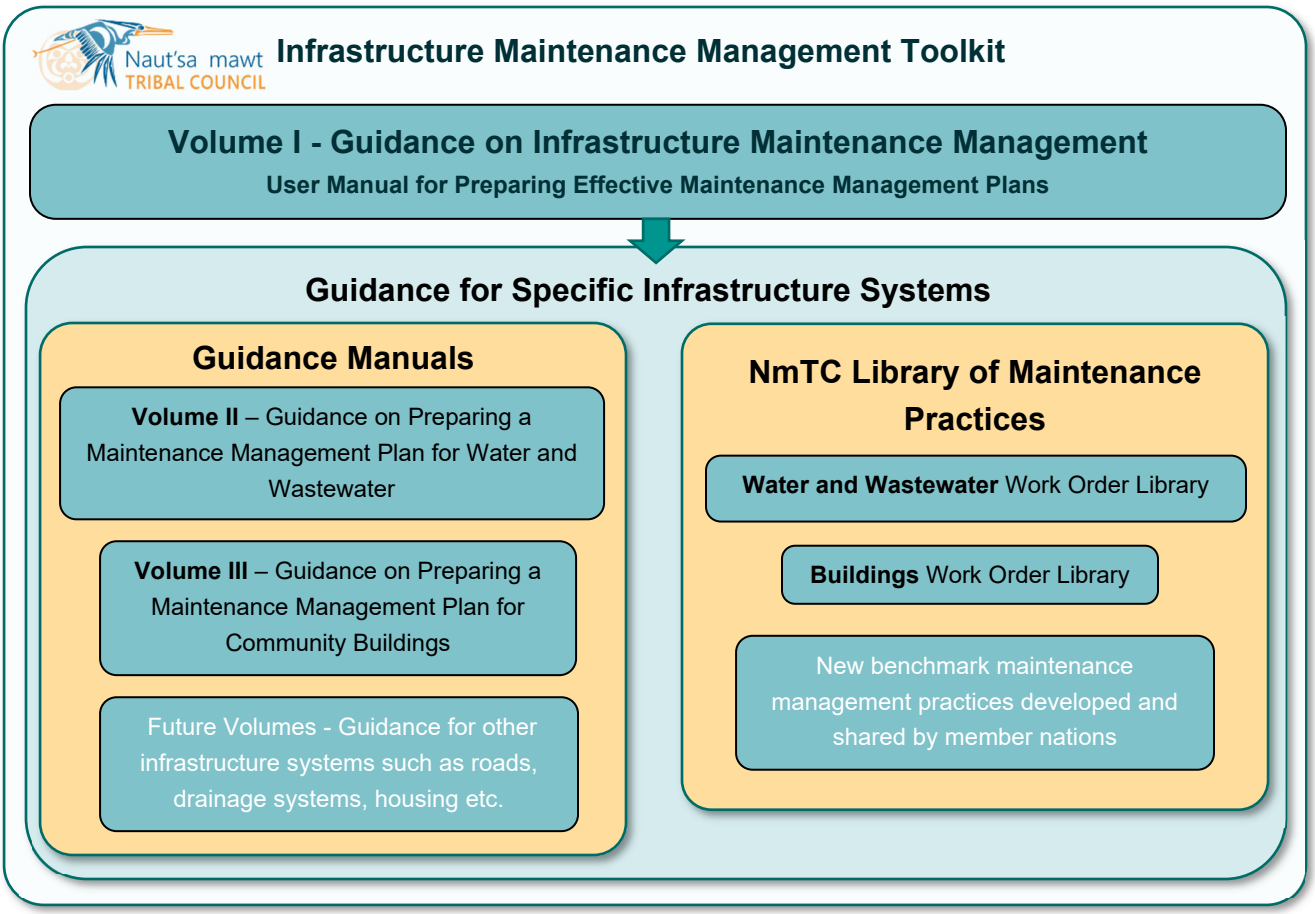
Introduction

Through the Naut'sa mawt Tribal Council (NmTC) Housing and Infrastructure Community of Practice, Naut'sa mawt Member First Nations are working to improve infrastructure management and operational practices. They communicate and share knowledge with each other and collaborate on initiatives. The Nations are working towards a structured, collaborative approach to capacity building, including ready access to relevant information, tools and benchmarks.

Effective maintenance is a key component of preparing and implementing Community Infrastructure Services Plans (CISPs). Readers should refer to the companion document entitled "Preparing a Community Infrastructure Services Plan – User Manual and Sample Plan – Naut'sa mawt Tribal Council – 2021" for more details on the CISP approach.

To promote effective maintenance, Naut'sa mawt prepared the Infrastructure Maintenance Management Toolkit – see Figure 1. The Toolkit provides a step-by-step "how to" method that can be applied to preparing and implementing effective Maintenance Management Plans (MMPs) for all types of community infrastructure, including: water and sewer systems; community buildings; roads; drainage systems; and (potentially) housing.

Figure 1 - Infrastructure Maintenance Management Toolkit



To demonstrate the step-by-step approach to preparing MMPs, NmTC has already prepared 3 Volumes as follows:

Volume I ➢ Guidance on Infrastructure Maintenance Management – *Provides general guidance applicable to all types of infrastructure.*

Volume II ➢ Guidance on Preparing a Maintenance Management Plan for Water and Wastewater. ***(This Manual)***

Volume III ➢ Guidance on Preparing a Maintenance Management Plan for Community Buildings.

Volumes 2 and 3 apply the general approach set out in Volume 1 and expand scope and level of detail as needed to suit system specific requirements.

Over time, NmTC hopes to expand the Toolkit to include Volumes for other infrastructure systems such as roads, drainage systems and housing.

Effective maintenance is key to successful and efficient delivery of community infrastructure services. As such, key drivers for improving maintenance management include:

- Operations and maintenance (O&M) usually represent over 80% of the total life-cycle cost of asset ownership – value for money in asset management is dependent on effective maintenance management;
- Most communities believe that maintenance funding is insufficient. An effective path to sufficient funding is to demonstrate actual maintenance management revenues and expenses using a formal maintenance budgeting process. The development and implementation of the MMP budget as laid out in this guide will provide documentation of actual maintenance expenses
- Maintenance funding requirements will increase over time as infrastructure ages;
- First Nations need more effective maintenance practices to comply with their Financial Administration Laws (FALs). For example:
    - FNs need to improve Life Cycle Management (LCM) Practices that optimize capital and O&M costs over the service life of an asset; for example, paying more up-front for better construction standards can lead to lower O&M costs and, thereby, lower life-cycle costs;
    - A sustainable funding strategy is required for both capital and O&M. Currently, most FNs have no structured budgeting or funding for O&M, repairs, replacements and/or upgrades;

  - There is usually insufficient financial information in a form suitable for effective financial management. To justify budgets and to manage performance, FNs need more structured budgeting and accounting practices involving details on specific maintenance activities;

- First Nations and Indigenous Services Canada have many competing demands for limited funding; effective financial management, including good maintenance budgeting and cost control, will be critical to "making the case" for sufficient, sustainable funding.

The Infrastructure Maintenance Management Toolkit addresses these key drivers by:

- Promoting efficiency and consistency through a comprehensive, common structure of infrastructure types and component categories that generally apply to all community infrastructure;

- Establishing a Library of benchmark, activity based maintenance practices that include details on scope, procedures, cost and schedule.

  First Nations can assemble MMPs that are specific to their local infrastructure needs by extracting relevant benchmark practices from the Library of Maintenance Practices. Essentially, Nations should select relevant practices from the Library and adjust them, if necessary, to suit their specific needs. Where a necessary practice is not already included in the Library, the Nation should develop such practice using the benchmark template/approach and should contribute the new practice to expand the Library. In that way, the Library is an evolving body of relevant maintenance management knowledge that is continuously refined and expanded over time based on needs and experience.

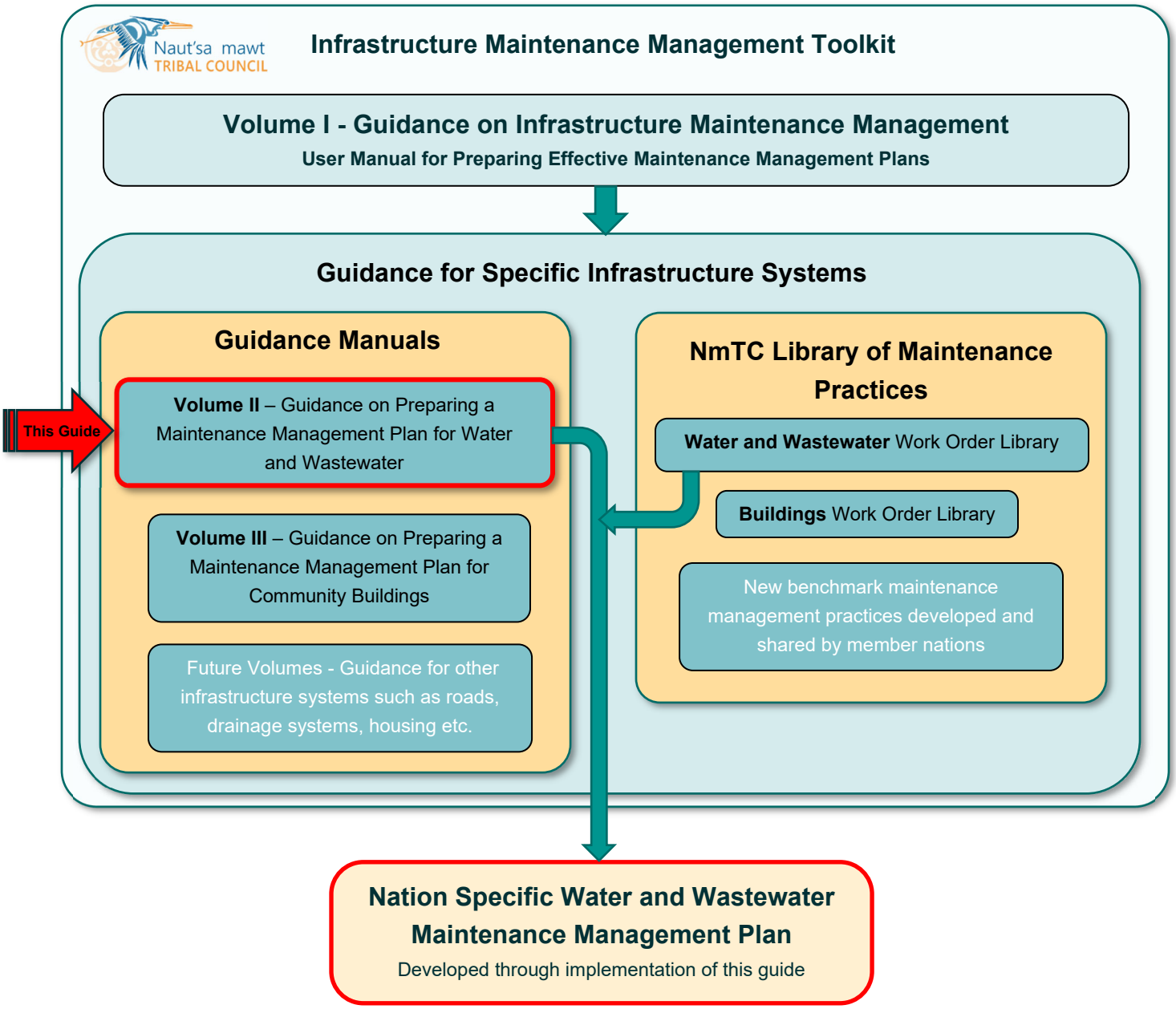
- Identifying technical competencies needed to carry out work – including identifying work that can reasonably be done by semi-skilled vs. skilled staff.

The Infrastructure Maintenance Management Toolkit represents the outcome of extensive input by relevant stakeholders including: Naut'sa mawt Members' staff; ISC Circuit Riders; and industry specialist consultants and contractors.

Using The Guide

As discussed in the introduction, this guide is a companion user manual developed as part of the **Infrastructure Maintenance Management Toolkit**. This position of this guide within the Toolkit is indicated by the **RED ARROW** below. Implementation of this guidebook will culminate in the production of a functional, nation specific Maintenance Management Plan for Water and Wastewater assets, including associated maintenance schedule and budget. For the purposes of this guide, "Wastewater" refers to Sanitary Sewer systems only.

Figure 2 – Volume II position within Infrastructure Maintenance Management Toolkit



This guide follows a step-by-step approach, introduced in the **Volume I – Guidance on Infrastructure Maintenance Management,** and further detailed in this Guidance Document. The guide is divided into three main sections based on the three steps:



This guide is supplemented by working files that will serve as templates for nation use. Nations are encouraged to re-format templates to suit their specific community needs. Supplementary files that have been included with this guide as part of the Library include:

- **NmTC MMP Water and Wastewater Workbook.xls**
- **NmTC Water and Wastewater Work Order Database.xls**
- **NmTC MMP Template.xls**

These documents will be referenced throughout this guide, and readers are encouraged to have files readily available as they navigate through the three steps of Water and Wastewater MMP development.

All documents in the Library are provided as a starting point, and users might not find everything they need in the documents supplied. Some communities may need to develop specific work orders to fill gaps in maintenance activities. Where possible, First Nations are encouraged to utilize the work order format provided, and to submit the work orders to the NmTC database to strengthen the **NmTC Library of Maintenance Practices.**

Upon completion of a community specific MMP as set forth in this guide, it is anticipated that the community will have a benchmark plan that includes asset specific maintenance plans, costs, and labour, equipment and material required to perform preventative and major maintenance tasks for community water and wastewater infrastructure.



STEP 1 : Develop an Asset Inventory

Supplementary Documents Required from NmTC Toolkit:

- **NmTC MMP Water and Wastewater Workbook.xls**
- **NmTC Water and Wastewater Work Order Database.xls**

ASSET INVENTORY OVERVIEW

The asset inventory is the backbone of the MMP, as such, compilation of the asset inventory is the first step of the MMP development process. An asset inventory, as the name implies, is a list of infrastructure components grouped by type, and generally includes details such as material, size, length, and age. An accurate asset inventory is a key component of a functional Maintenance Management Plan.

Water and Wastewater Infrastructure Assets are tangible capital assets that add value to the land and provide services to the community. This guide will focus exclusively on Water and Wastewater assets – specifically the components that make up:

- The water supply, treatment, and distribution system, and
- The wastewater (sanitary) conveyance, treatment, and disposal system.

Asset inventories can range from basic to complex and should be continually refined as more information becomes available. A community-specific inventory can generally be compiled through information presented on as-built civil servicing drawings which are commonly available as part of community records, through ISC, or through the engineering firm that completed the work. In the absence of servicing drawings, component information for ISC registered assets can be found in ACRS documents or can be physically located and measured in the field. As-built record information and ACRS component quantity survey information is suitable for basic inventory but may require refinement through ground-truthing (field survey of components). Key asset information such as coding, quantities, construction costs, replacement costs and depreciation (accumulated and annual) should be the same as recorded in the Tangible Capital Asset inventory used by Finance for financial reporting. Any differences should be reconciled. Nations are encouraged to build their asset inventory in the supplied excel template: **NmTC MMP Water and Wastewater Workbook.xls** provides in the document library.

For simplicity, water and wastewater assets in this guide are grouped in a system similar to that used by ISC's Extended Asset Condition Reporting System. The following table lists the asset group, subgroup and component for water and wastewater asset types specifically located in Naut'sa mawt Tribal Council communities:

Table 1 - Asset Component Hierarchy

ASSET GROUP	ASSET SUBGROUP	ASSET COMPONENT
WATER	Supply	Well
WATER	Supply	Reservoir
WATER	Supply	Mains
WATER	Treatment	Chlorination Unit
WATER	Distribution	Boost Station
WATER	Distribution	PRV
WATER	Distribution	Air Valve
WATER	Distribution	Mains
WASTEWATER	Collection	Gravity Main
WASTEWATER	Collection	Forcemain
WASTEWATER	Collection	Lift Station
WASTEWATER	Treatment	Lagoon
WASTEWATER	Treatment	Sewage Treatment Plant
WASTEWATER	Treatment	Community Septic Tank
WASTEWATER	Treatment	Community Septic Field
WASTEWATER	Disposal	Sewage Outfall

For the purposes of this manual, a standard number of manholes, valves, hydrants, and services have been assumed per unit length of water and wastewater main, as such specific inventory of these components is not immediately required. As Nation-specific Maintenance Manuals are refined, the inclusion of community-specific values for manholes, valves, blowoffs, hydrants, and services will further improve the accuracy and value of the MMP.

1.1. DEVELOP INVENTORY FOR EXISTING ASSETS

To ensure the most beneficial Maintenance Schedule and Budget output, accurate inventory of all system components listed in Table 1 is recommended. Steps 1.1.1 through 1.1.5 outline a suggested procedure to capture and document the asset information.

1.1.1. Assemble Reference Documentation

Creation of an asset inventory begins by gathering all pertinent documents. Useful resources that will assist in the preparation of an asset inventory include:

- As Constructed Servicing Drawings

- Service Record Cards
- Previous ACRS Reports

As-constructed drawings will provide the fastest and simplest access to water and wastewater infrastructure location, sizes, lengths, materials and year of construction. If as-constructed drawings for water and wastewater assets are not available through First Nation records, they can often be obtained through ISC (for registered assets) and sometimes through the engineering firm that designed the system.

Figure 3 below indicates the typical asset information available on an As-Constructed Servicing Drawing.

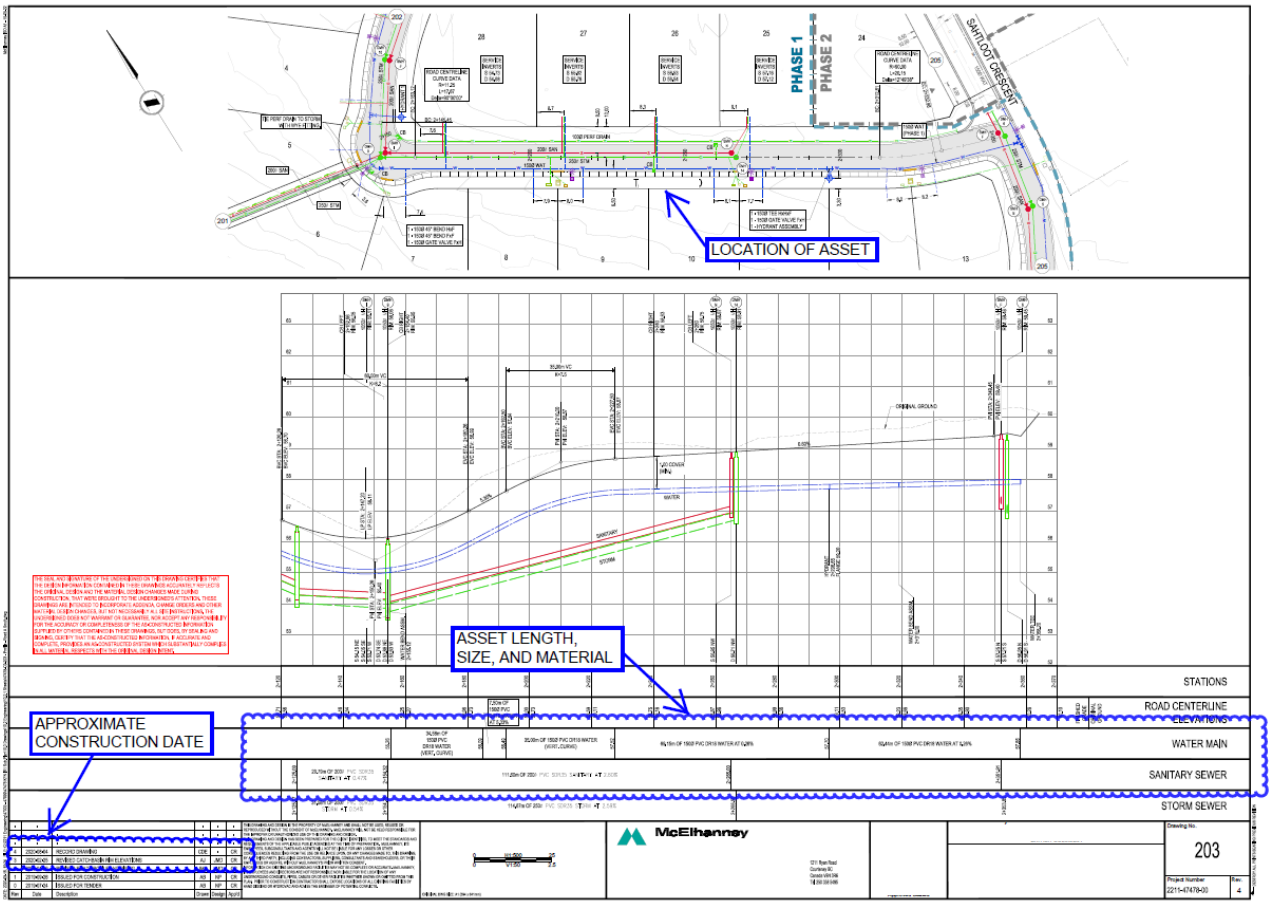


Figure 3 – Location of Asset Data on a Typical As-Constructed Servicing Drawing

If As-Constructed drawings are not available, past ACRS reports can be a good resource for listed assets. **Figure 4** indicates the typical information that can be found on an ACRS Needs Identification sheet. It is worthwhile to note that all construction documentation including as-constructed drawings for listed assets are stored in ISC records. As-constructed drawings can be requested from ISC and contain more detailed asset information than ACRS reports. Wherever possible, obtaining actual record drawings is preferrable to using ACRS data.

ASSET CONDITION REPORTING SYSTEM
NEEDS IDENTIFICATION

Schools ☐ Buildings ☐ Roads ☐ Bridges ☐ Water ☑ Wastewater ☐ Other ☐

Region Name	Reserve No.	Reserve Name
BC		

First Nation No.	First Nation Name	Asset Location

Asset Code	Asset No.	Ext. No.	Facility Code	Asset Name	Inspected By
B1B	401000	01		Water System Mains	abrink

Date Inspected YYYY/MM/DD	Year of Construction	Estimated Remaining Life (Years)	Quantity (m)	(*1) General Condition Rating (0-10)	(*1) General Condition Ratings				
					0	1-3	4-6	7-9	10
2017/05/28	2004	87	335.0	9	Closed	Poor	Fair	Good	New

ASSET LOCATION, LENGTH, CONSTRUCTION DATE, AND CONDITION

Component Code No.	Project Description	Project Remarks					ount $)	Existing Project No.	*6 - Status
Existing Projects in INAC Database Still Outstanding - Provide Current Status									
A1.10	Mains	Conduct fire flow study for entire water system	3	4	4	0	30000	5	0
B11.2	Hydrants, clean and paint	Clean and paint hydrant located adjacent Band Office.	1	1	4	0	250	6	1
B11.3	Valves, locate, mark and exercise	Locate and mark hydrant and line valves with blue spray paint. Exercise each valve annually.	1	1	4	0	500	7	0
B11.2	Hydrants, clear vegitation	Clear vegetation and add hydrant sign on post beside the hydrant at the corner of Recommend installing the hydrant sign at 1.8m (6ft) above grade, and facing south towards	1	1	1	0	500	8	0
New Projects Identified This ACRS Inspection									

Comments:	This asset is a water distribution system consisting of 150mm dia PVC. This asset is currently in good operating condition. No new projects identified.

ASSET SIZE AND MATERIAL

Figure 4 - Typical ACRS Needs Identification Sheet

1.1.2. Define Water and Wastewater Assets

Defining Water and Wastewater assets by a unique asset code is crucial for referencing, identifying, and logging asset data information. ISC uses the "ICMS Asset Code" (eg. 402000-02) to differentiate and itemize assets within a community. **Figure 5** below displays water asset ID's typical to ACRS reports.

First Nation No.	First Nation Name	Title/Description
		Water Map

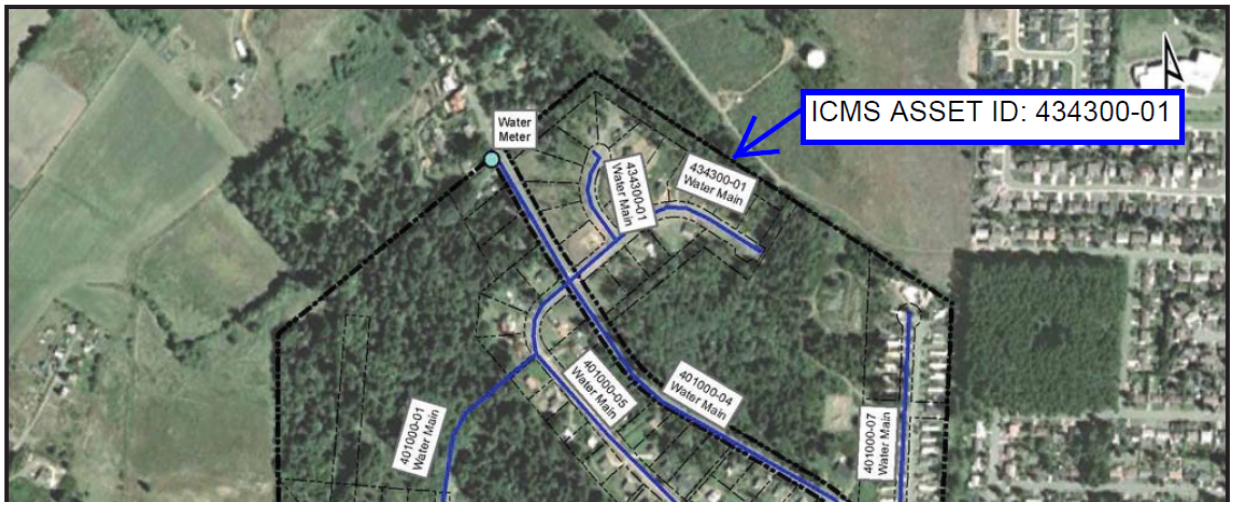


Figure 5 - Example - ICMS Asset ID

ICMS assets are commonly grouped by "project" and are not always differentiated by size and material. In other words, ICMS Asset ID 434300-01 could contain 100mm diameter and 150mm diameter mains. Note that ICMS Asset IDs are only available for ISC funded assets.

For the purposes of this guide, it is recommended that assets are differentiated by location, type, size, and material. It is recommended that a unique "Nation Asset Code" be created for each asset based on location, type, size, and material. Including a distinct entry for each asset will provide maintenance crews with more accurate information and allow for more precise maintenance and replacement cost projections. It is recommended that the asset definition be completed in supplementary document **NmTC MMP Water and Wastewater Workbook.xls**, included with this guide.

NATION ASSET CODE	ICMS ASSET CODE	LOCATION DESCRIPTION
NAT-WM-001	434300-01	Chlorine Treatment to Water Treatment Plant
NAT-WM-002	434300-01	Water Treatment to Reservoir
NAT-WM-003	434300-01	Main Road North
NAT-WM-004	401000-02	Main Road East of 2nd Ave
NAT-WM-005	401000-02	Main Road West of 2nd Ave
NAT-WM-006	401000-04	1st ave North
NAT-WM-007	401000-04	2nd Ave North
NAT-WM-008	401000-04	1st Ave to Main Rd.
NAT-WM-009	402000-01	1st Ave to Waterfront Rd.
NAT-WM-010	402000-01	Waterfront Road

Figure 6 - Asset Definition Example

In the example above, the watermain on Main Road changes from 100mm PVC to 150mm PVC at 2nd Ave, therefore dividing the watermain into two distinct assets – NAT-W-004 and NAT-W-005. Note that unlisted assets will NOT have an ICMS asset code.

1.1.3. Input Water and Wastewater Main Data

Once assets have been appropriately defined, asset data can be entered into the database. This can be done in conjunction with step 1.1.2. Data required for Water and Wastewater mains includes Asset Group, Asset Subgroup, Asset Component, Material, Size, and Length. These variables inform maintenance costs, maintenance man-hours required, and asset life-cycle replacement costs. Date of Installation and Condition are recommended input fields, but not required. YELLOW fields indicate required data, whereas ORANGE fields denote fields that are recommended.

Example inventories for Wastewater and Water main assets are shown in **Figures 7, 8, and 9** below. Figure 7 demonstrates the integration of the asset data with the asset definition from 1.1.2. In order for the Schedule and Budget to auto-generate based on inventoried assets, the asset data must be input into the supplementary document **NmTC MMP Water and Wastewater Workbook.xls,** included with this guide.

NATION ASSET CODE	ICMS ASSET CODE	LOCATION DESCRIPTION	ASSET GROUP	ASSET SUBGROUP	ASSET COMPONENT	MATERIAL	SIZE	LENGTH	DATE OF INSTALLATION	CONDITION
NAT-WM-001	434300-01	Chlorine Treatment to Water Treatn	WATER	Distribution	Main	PVC	200	457.2	1999-01-01	Good
NAT-WM-002	434300-01	Water Treatment to Reservoir	WATER	Distribution	Main	PVC	200	631.3	1999-01-01	Fair
NAT-WM-003	434300-01	Main Road North	WATER	Distribution	Main	AC	150	167.2	1984-01-01	Good
NAT-WM-004	401000-02	Main Road East of 2nd Ave	WATER	Distribution	Main	AC	150	158.8	1984-01-01	Good
NAT-WM-005	401000-02	Main Road West of 2nd Ave	WATER	Distribution	Main	AC	150	325.5	1980-01-01	Good
NAT-WM-006	401000-04	1st ave North	WATER	Distribution	Main	AC	150	491.4	1984-01-01	Good
NAT-WM-007	401000-04	2nd Ave North	WATER	Distribution	Main	AC	150	402.4	1984-01-01	Poor
NAT-WM-008	401000-04	1st Ave to Main Rd.	WATER	Distribution	Main	AC	150	293.0	1984-01-01	Fair
NAT-WM-009	402000-01	1st Ave to Waterfront Rd.	WATER	Distribution	Main	PVC	50	170.9	1984-01-01	Excellent
NAT-WM-010	402000-01	Waterfront Road	WATER	Distribution	Main	AC	150	705.4	1984-01-01	Excellent

Figure 7 - Asset Definition and Data Example

ASSET GROUP	ASSET SUBGROUP	ASSET COMPONENT	MATERIAL	SIZE	LENGTH	DATE OF INSTALLATION	CONDITION
WATER	Distribution	Main	PVC	200	457.2	1999-01-01	Good
WATER	Distribution	Main	PVC	200	631.3	1999-01-01	Fair
WATER	Distribution	Main	AC	150	167.2	1984-01-01	Good
WATER	Distribution	Main	AC	150	158.8	1984-01-01	Good
WATER	Distribution	Main	AC	150	325.5	1980-01-01	Good
WATER	Distribution	Main	AC	150	491.4	1984-01-01	Good
WATER	Distribution	Main	AC	150	402.4	1984-01-01	Poor
WATER	Distribution	Main	AC	150	293.0	1984-01-01	Fair
WATER	Distribution	Main	PVC	50	170.9	1984-01-01	Excellent
WATER	Distribution	Main	AC	150	705.4	1984-01-01	Excellent

Figure 8 - Watermain Asset Data Inventory Example

ASSET GROUP	ASSET SUBGROUP	ASSET COMPONENT	MATERIAL	SIZE	LENGTH	DATE OF INSTALLATION	CONDITION
SANITARY	Collection	Main	AC	200	248.18	1-Jan-1983	Good
SANITARY	Collection	Main	AC	150	113.15	1-Jan-1983	Good
SANITARY	Collection	Main	PVC	150	575.42	1-Jan-1995	Good
SANITARY	Collection	Main	AC	150	302.82	1-Jan-1983	Good
SANITARY	Collection	Main	AC	200	560.09	1-Jan-1983	Excellent
SANITARY	Collection	Main	AC	100	91.65	1-Jan-1983	Excellent
SANITARY	Collection	Main	AC	100	142.95	1-Jan-1983	Excellent
SANITARY	Collection	Main	AC	150	204.91	1-Jan-1983	Good
SANITARY	Collection	Main	AC	150	72.07	1-Jan-1983	Good
SANITARY	Collection	Main	AC	150	230.52	1-Jan-1983	Good

Figure 9 - Sanitary Main Asset Data Inventory Example

All yellow shaded cells in the provided workbook are mandatory variables. This data will be used to develop projected budgets and schedules in Step 2.

For the purposes of this manual, operation and maintenance costs for mains have been developed assuming a standard number of manholes, valves, hydrants, and services per unit length of water and wastewater main. As Annual Maintenance Schedules and Budges are refined, the inclusion of community-specific values for components including Manholes, Water valves, Hydrants, and Blowoffs will further improve projections. Community specific assumptions can be input in the “ASSUMPTIONS” field located on the Table of Contents tab, in supplementary document **NmTC MMP Water and Wastewater Workbook.xls**. An example of the input table is provided in **Figure 10**, below.

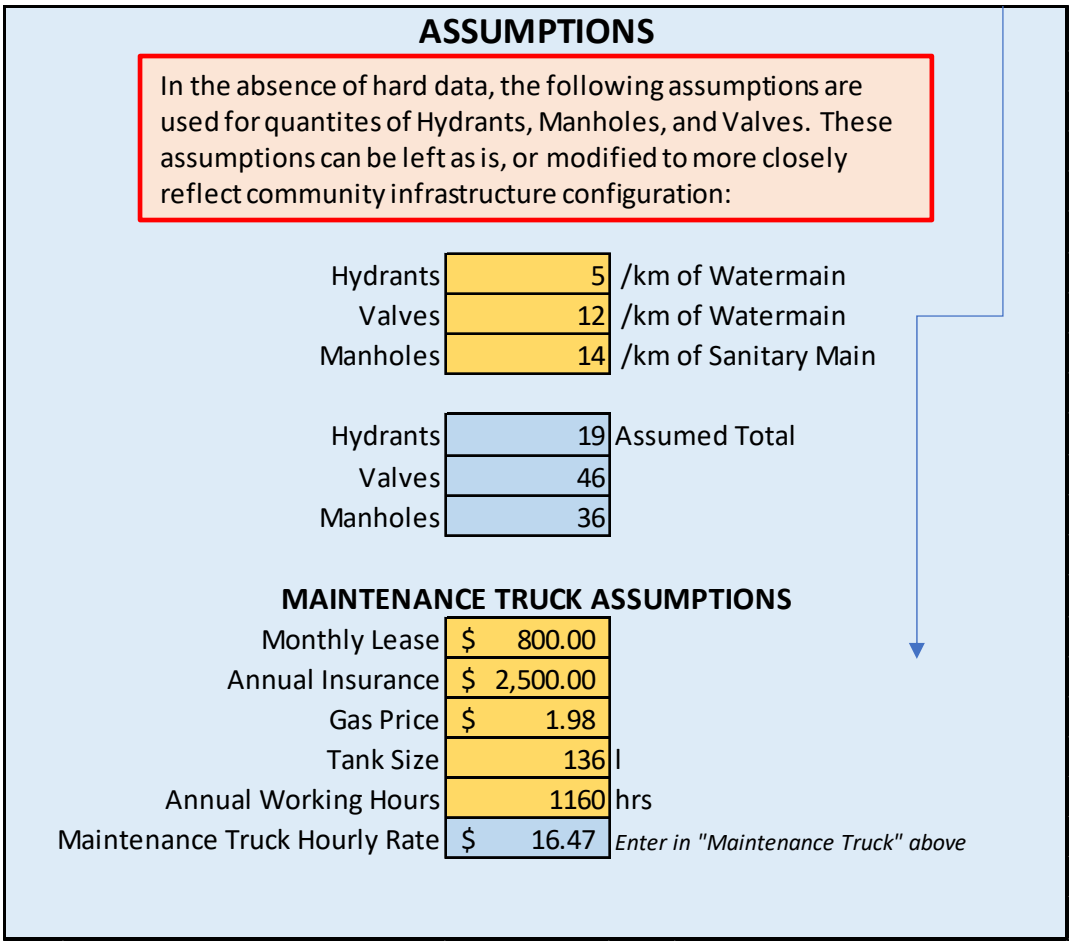


Figure 10 - Community Specific Assumptions

1.1.4. Input Water Supply and Treatment, and Wastewater Treatment and Disposal Data

System components for Water Supply and Treatment, and Wastewater Treatment and Disposal, must also be inventoried. Similar to water and wastewater mains, required asset data entry for Water Supply and Treatment, and Wastewater Treatment and Disposal assets will include Asset Group, Asset Subgroup, Asset Component, Date of Installation, and Condition. Nation Asset Code, ICMS Asset Code, and Location Description are also recommended.

Example inventories for Water Supply and Treatment, and Wastewater Treatment and Disposal assets are shown in **Figure 11** below. It is recommended that asset data input be completed in supplementary document **NmTC MMP Water and Wastewater Workbook.xls**, included with this guide.

NATION ASSET CODE	ICMS ASSET CODE	LOCATION DESCRIPTION	ASSET GROUP	ASSET SUBGROUP	ASSET COMPONENT	TYPE	SIZE	UNIT	DATE OF INSTALLATION	CONDITION
NAT-WTP-001	402001-01	Access Rd.	WATER	Treatment	Water Treatment Plant			m3/s	1999	Good
NAT-WR-002	403002-01	Access Rd.	WATER	Storage	Reservoir	Steel	136.4	m3	1984	Fair
NAT-WR-003	403002-02	Access Rd.	WATER	Storage	Reservoir	Steel	136.4	m3	1984	Fair
NAT-WR-004	403002-03	Access Rd.	WATER	Storage	Reservoir	Steel	800	m3	1998	Good
NAT-LS-005	407001-01	1st Street	SANITARY	Collection	Lift Station	Duplex	2	hp		
NAT-LS-006	404002-01	2nd Street	SANITARY	Collection	Lift Station	Duplex	2	hp		
NAT-LS-007	406001-01	Waterfront Road	SANITARY	Collection	Lift Station	Duplex	7.5	hp	1984	Poor
NAT-STP-008	401100-01	1st Street	SANITARY	Treatment	Sewage Treatment Plant	RBC		m3/s	1984	Poor
NAT-CSF-009	401100-02	1st Street	SANITARY	Treatment	Community Septic Field			m2	1984	Poor
NAT-CFT-010	401100-03	1st Street	SANITARY	Treatment	Community Septic Tank			m3	1984	Poor

Figure 11 - Non-Linear Water and Wastewater Asset Data Example

As with linear assets, all yellow shaded cells in the provided workbook are mandatory variables. The UNIT column will auto-populate with the size units associated with each Asset Component entered.

The data entered in ASSET INVENTORY tabs 1, 2, and 3 will inform the output in tabs 4, 5, and 6: WORK ORDERS, SCHEDULE, and BUDGET, as outlined in Step 2. See Figure 12 below.

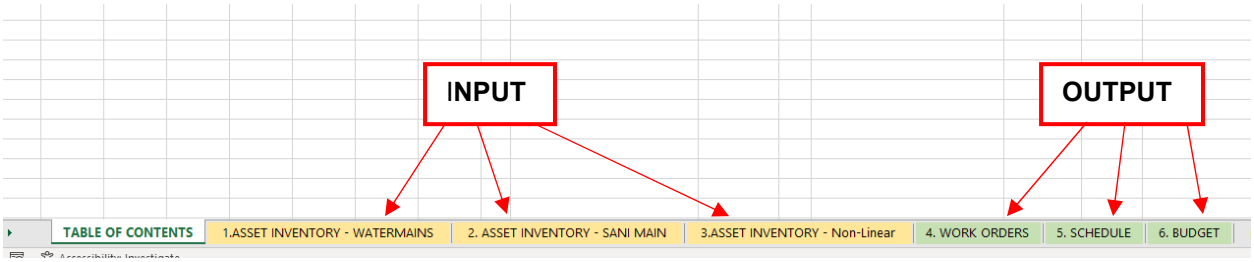


Figure 12 - Workbook Tabs

1.1.5. Asset Condition Assessment

For some easily accessible assets, condition can be visually determined by qualified maintenance staff according to the condition assessment scale in Table 2. For a comprehensive assessment of community-wide asset condition it is recommended that the Nation engage a qualified professional to inspect assets and assess condition according to the scale below:

Table 2 - Condition Assessment Scale

1	2	3	4	5
Not Fit for Purpose: Serious Deficiencies. Significant Health or Safety Risk	Major Defects: Components not functioning to required level of service. Potential heath or safety risk.	Major Defects: Components function with intervention/ supervision. No serious health or safety risk	Minor Defects: All components function as intended. No heath or safety risk	Fit for Purpose: All components function well. No health or safety risk

While asset condition is not a factor used in the development of annual O&M budgets and schedules through this guidebook, it is a valuable attribute that can be used in projections to estimate remaining service life and forecast component replacement.

1.2. ADD, CHANGE, OR DELETE ASSETS

The Asset Inventory is an evolving document. As assets are replaced, upgraded, decommissioned, or as new assets are added, the inventory must be updated to reflect the changes. This procedure is only required when an asset status changes and may be skipped upon initial Asset Inventory development.

The following procedure outlines the steps to be taken should a new, altered, upgraded, or deleted asset be identified:

1.2.1. To ADD an asset:

1. Update STEP 1 - Asset Inventory

    a. Assemble Reference Documentation **(Section 1.1.1):** For NEW assets this will include new as-built drawings, and any available component maintenance and operation manuals provided by the contractor.

    b. Define Asset **(Section 1.1.2):** Determine Asset Location, Asset ICMS Code (if applicable) and create a Nation Asset Code. Add new Asset Definition to a new line in the Asset Inventory.

c. Input Asset Data **(Sections 1.1.3 and 1.1.4):** From information on Record Drawings, input Asset Group, Asset Subgroup, Asset Component, Material, Size and Length (if applicable), Date of Installation, and Condition.

2. Update STEP 2 –Maintenance Management Plan

   a. Add all Reference Documentation for NEW Asset to **MMP Section 3**.

   b. Assemble all relevant Health and Safety Policies and Procedures specific to the New Asset. List new Policies and Procedures in **MMP Section 4**.

   c. Update Preventative Maintenance Schedule by adding any new work order codes to Workbook Tab **5. Schedule**. Note that additional crew hours for added O&M will populate in the Schedule "Crew Hours" and will have to be manually distributed in the schedule.

   d. Update Preventative Maintenance Budget by adding any new work order codes to Workbook tab **6. Budget**. Note that additional crew hours for added O&M will populate in the Budget "Crew Hours", which will be reflected in the Total O&M budget.

   e. Determine additional work orders required. Retrieve any new work orders from the Work Order Database, add new work orders in **MMP Section 8**, and add to **MMP Appendix C**.

1.2.2. To DELETE an asset:

1. Update STEP 1 - Asset Inventory

   a. Determine Nation Asset Code of asset to be deleted. Note – a decommissioned watermain may be comprised of several assets and have more than one Nation Asset Code.

   b. In the asset inventory, reduce asset length/size to "0" – This will delete all asset output while retaining decommissioned asset data for future information.

2. Update STEP 2 – Maintenance Management Plan

   a. Remove Reference Documentation for deleted asset from **MMP Section 3**. Archive outdated documents.

   b. Remove any Health and Safety Policies and Procedures that are applicable **ONLY** to the deleted Asset **MMP Section 4**.

   c. Determine if any work orders in the MMP are applicable **ONLY** to the deleted asset. If so, remove the Work Order from list in **MMP Section 8**, and from **Appendix C**.

   d. Update Preventative Maintenance Schedule by removing any work order codes that applied **ONLY** to the deleted asset. Note that reduced crew hours will populate in the Schedule "Crew Hours" and will have to be manually removed from the schedule.

e. Update Preventative Maintenance Budget by removing any new work order codes that apply **ONLY** to the deleted asset. Note that reduced crew hours will populate in the Budget "Crew Hours", which will be reflected in the Total O&M budget.

1.2.3. To UPDATE an existing asset:

1. Update STEP 1 - Asset Inventory

    a. Assemble Reference Documentation **(Section 1.1.1):** For major asset upgrades, this will often include new as-built drawings, but for minor upgrades, this could simply be a work order detailing a component replacement. In addition to the above, assemble any available component maintenance and operation manuals provided by the contractor.

    b. Define Asset **(Section 1.1.2):** Determine Nation Asset Code or Codes specific to the upgraded asset.

    c. Input Asset Data **(Sections 1.1.3 and 1.1.4):** From information on Record Drawings or work order, update Material, Size, Length. Date of Installation, and/or Condition, as applicable.

2. Update STEP 2 – Maintenance Management Plan

    a. List any updated Reference Documentation in **MMP Section 3**.

    b. Determine if Health and Safety Policies and Procedures specific to the upgraded asset have changed. List any updated Policies and Procedures in **MMP Section 4**.

    c. Determine if upgraded component requires new work orders. Retrieve any new work orders from the Work Order Database, list in **MMP Section 8** and add to **Appendix C**.

    d. Update Preventative Maintenance Schedule by adding any new work order codes to Workbook Tab **5. Schedule**. Note that any change in crew hours due to a change in Work Order requirements will populate in the Schedule "Crew Hours" and will have to be manually distributed in the schedule.

    e. Update Preventative Maintenance Budget by adding any new work order codes to Workbook Tab **6. Budget**. Note that change in crew hours due to a change in Work Order requirements will populate in the Budget "Crew Hours", which will be reflected in the Total O&M budget.



2.STEP 2: Develop Maintenance Management Plan

Supplementary Documents Required from NmTC Toolkit:

- **NmTC MMP Template.xls**
- **NmTC MMP Water and Wastewater Workbook.xls**
- **NmTC Water and Wastewater Work Order Database.xls**

MAINTENANCE MANAGEMENT PLAN OVERVIEW

A Maintenance Management Plan a compilation of documents, data, and procedures that provides the necessary guidance to ensure critical assets (in this case water and wastewater) continue to operate as efficiently as intended, delivering maximum performance for the lowest cost. The elements of the Maintenance Management Plan are informed by the Asset Inventory, created in Step 1.

Elements of the MMP:

- Summary of Water and Wastewater System Components
- Available Engineered Drawings and Component Maintenance Manuals
- Health and Safety Policies
- Relevant Regulations, Policies, and Permits
- Preventative Maintenance Schedule
- Preventative Maintenance Budget
- Work Orders

An MMP outline is provided as part of this guide and can be used as a framework from which to build a nation specific MMP. Alternatively, nations can choose to develop their own document based on the above-noted elements.

The following sections outline the process through which the above noted information is gathered and input into the **NmTC MMP Template.xls** template document.

2.1. SUMMARIZE WATER AND WASTEWATER ASSETS

The first section in the MMP provides a summary overview of the asset components that make up the water and wastewater system. Upon completion of the Asset Inventory in Step 1, the Community Infrastructure Summary will auto-populate on the Table of Contents page, as shown in **Figure 13**.

NOTE:
After any updates to the Asset Inventory tabs, the **SYSTEM COMPONENT** table must be updated - Right click anywhere within the SYSTEM COMPONENT table and click "Refresh" to update data. *(Data will not update automatically, only when manually refreshed or when file is closed and re-opened.)*

COMMUNITY INFRASTRUCTURE SUMMARY

TOTAL WATERMAINS	3.8	km
TOTAL SANITARY MAINS	2.5	km
TOTAL FORCEMAINS	0.7	km
TOTAL HYDRANTS	19	
TOTAL VALVES	46	
TOTAL MANHOLES	36	

SYSTEM COMPONENT	QUANTITY
Water Treatment Plant	1
Lift Station	3
Community Septic Field	1
Community Septic Tank	1
Reservoir	3
Sewage Treatment Plant	1

Figure 13 - Summary of Community Infrastructure Assets - Workbook Table of Contents

This data can be directly input into Section 2 of the MMP, as shown in **Figure 14**. The Community Infrastructure Summary provides a good check to ensure all aspects of the Water and Sanitary system have been entered into the Asset Inventory.

2. Water and Wastewater Asset Summary

Example First Nation water and wastewater infrastructure assets on IR#1 consist of the following:

SANITARY SYSTEM COMPONENT	QUANTITY
Gravity Sanitary Sewer	3 km
Sanitary Lift Stations	3
Sewage Treatment Plant	1
Community Septic Tank and Field	1

WATER SYSTEM COMPONENT	QUANTITY
Watermains	4 km
Water Treatment Plant	1
Steel Reservoir	3

Figure 14 - MMP Section 2 - Asset Summary

2.2. ASSEMBLE WORK ORDERS

The **NmTC Water and Wastewater Work Order Database.xls** provided with this document contains a library of standard work orders for maintenance of typical water and wastewater infrastructure. The work orders describe the method, man-hours, and equipment required to complete a standard maintenance task. When used regularly, work orders can be a useful tool to track O&M expenses and generate evidence-based budget projections as effort and material costs are refined. Each Work Order included in the Library describes:

- The location of components of the system to be maintained;
- The asset quantity and/or number of inventory units to be maintained;
- Step by step, simple instructions of the routine and special maintenance duties;
- The safe number of persons required, and the equipment, tools and materials needed;
- The frequency or level of service;
- Estimated number of person-hours involved in each task;
- Contracted services if required.
- Safety measures required to complete the task.

WORK ORDER **W01**

ASSET		ORDER DATE	
ASSET GROUP	WATER	PO#	
ASSET SUBGROUP	Supply / Distribution	START DATE	END DATE
ASSET COMPONENT	Main		
TASK DESCRIPTION	Monthly Distribution System Inspection	RECEIVED BY:	
FREQUENCY	Monthly (est. 0.3 hr/km of watermain)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly inspection of distribution system
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Valve wrench set, Valve pick
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	$ -

REFERENCE DOCUMENTS
❑ Worksafe/Occupational Health & Safety Regulations: ❑ Ergonomics (MSI) Requirements ❑ Personal Protective Clothing and Equipment

Maintenance activities included in the work orders provided include: Inspections, cleanings, lubrications, adjustments, replacements, calibrations – Maintenance tasks suggested in this manual are generic to equipment type, and should be modified to suit each community based upon specific equipment manufacturer instructions and operator experience. Mechanical equipment such as Lift Station Pumps and Air Release Valves have specific maintenance instructions provided by the manufacturer that should accompany the maintenance tasks suggested in this document.

The work orders included in this document are provided as a benchmark. Communities are encouraged to refine, expand, or simplify the forms provided to suit specific needs

2.2.1. Compile Asset Specific Work Orders

The asset inventory compiled in Step 1 will inform the selection of work orders in Step 2. Upon completion of the asset inventory, a list of suggested work orders for infrastructure components identified in Asset Inventory is generated in workbook tab 4. WORK ORDERS.

ASSET GROUP	ASSET SUBGR	TASK CODE	TASK DESCRIPTION	FREQUENCY
SANITARY	Collection	LS01	Lift Station Weekly Inspection	Weekly
		LS02	Lift Station Monthly Inspection	Monthly
		LS03	Lift Station Quarterly Inspection and Maintenance	Quarterly
		LS04	Lift Station Semi-Annual Inspection and Maintenance	Semi-Annual
		LS05	Lift Station Annual Inspection and Maintenance	Annual
		LS06	Pump out and flush wet well - vac truck	Annual
		S01	Annual Sanitary Main Inspection	Annual
		S02	Main Flushing and Cleaning	Every 3 Years
		S03	CCTV Inspection	Every 10 Years
		S04	Vac Truck	As Required
		S07	Annual Sanitary Air Release Valve Inspection and Maintenance	Annual
		ST17	Monthly Influent Screen Inspection	Monthly
		ST18	Monthly Spray Pump Inspection	Monthly
		ST19	Quarterly Chemical Dosing Pump Maintenance	Quarterly
		ST20	Semi-Annual Flocculator Tank Maintenance	Semi-Annual
		ST21	Semi-Annual Filter Maintenance	Semi-Annual
		ST22	Semi-Annual Chemical Dosing Pump Maintenance	Semi-Annual
	Treatment	ST03	Septic Tank Pumping	Every 5 years
		ST04	Monthly Septic Tank Inspection	Monthly
		ST05	Bi-Annual Septic Tank and Field Inspection and Maintenance	Bi-Annual
		ST06	Sewage Treatment Plant Inspection	Daily
		ST07	Weekly Effluent Pump Station Inspection and Maintenance	Weekly
		ST08	Annual Effluent Pump Station Inspection and Maintenance	Annual
		ST09	RBC Module Inspection	Monthly
		ST10	Secondary Clarifiers Inspection and Maintenance	Daily
		ST11	Chlorinators and Tank Inspection	Weekly
		ST12	Annual Chlorinators and Tank Inspection and Maintenance	Annual
		ST13	Dechlorinator Inspection and Maintenance	Weekly
		ST14	Flow Recorder Inspection	Weekly
		ST15	Outfall Inspection	Monthly
		ST16	Flume Chamber	Bi-Weekly
WATER	Distribution	W01	Distribution System Inspection	Monthly
		W02	Annual Valve Inspection and Maintenance	Annual
		W03	Watermain Flushing	Annual
		W04	Hydrant Inspection, Maintenance, and Flushing	Annual
		W07	Winterizing Water System	As Required
		W08	Watermain Spot Repairs	As Required
		W09	Curb Box and Curb Stop Repairs	As Required
		W10	Fire Hydrant and Standpipe Test	3 Times per Year
		W11	Valve Repair	As Required
		W12	Hydrant Repair (General)	As Required
		W13	Hydrant Repair (Internal)	As Required
		W14	Hydrant Painting	As Required
		W15	Air Release Valve Inspection and Maintenance	Bi-Annual
	Storage	WS01	Weekly Inspection of Water Storage Facility	Weekly
		WS02	Monthly Inspection and Maintenance of Storage Facility	Monthly
		WS03	Quarterly inspection and Maintenance of Storage Facility	Quarterly
		WS04	Annual Inspection and Maintenance of Water Storage Facility	Annual
		WS05	Three to Five year inspection and Maintenance of Storage Facility	Every 3 Years
	Treatment	WT04	Water Treatment Plant Daily Inspection	Daily
		WT05	Water Treatment Plant Week Day Inspections	Weekdays
		WT06	Water Treatment Plant Periodic Inspections and Testing	Weekly
		WT07	Water Treatment Plant Filter Scraping	6 times/year
		WT08	Water Treatment Plant Media Addition	Every 6 years

*Figure 15 - Workbook Tab **4. WORK ORDERS***

The work order library provided will likely contain more work orders than are relevant to each specific community. Follow the following steps to create a community specific file of work orders:

- Create a copy of the **NmTC Water and Wastewater Work Order Database.xls** excel database, provided with this guide.
- Delete all non-applicable work orders by right-clicking on the tab and selecting delete

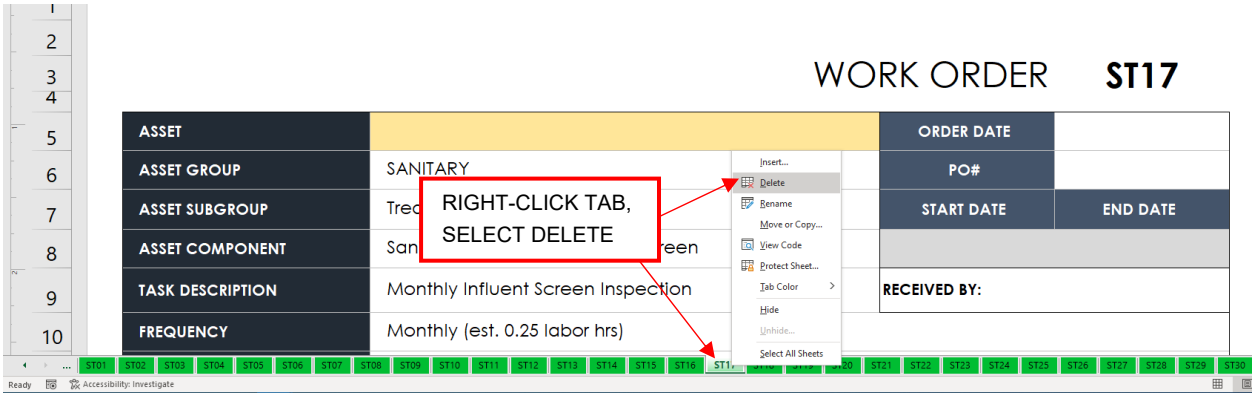


Figure 16 - Deleting Non-Applicable Work Orders from Community Work Order File

- Save all applicable work orders in **MMP Appendix C**.

2.2.2. To CREATE a new WORK ORDER:

The Work Order Library contains work orders for common water and wastewater infrastructure maintenance practices. It is expected that communities may need to develop additional work orders to suit unique community infrastructure. The following steps outline the process to develop and input a new work order for a new maintenance management task.

1. **Develop new Work Order document:**

    a. To create the new work order in the **NmTC Water and Wastewater Work Order Database.xls** file, right click on an existing tab and select Move or Copy to create a copy to work from as a starting point.

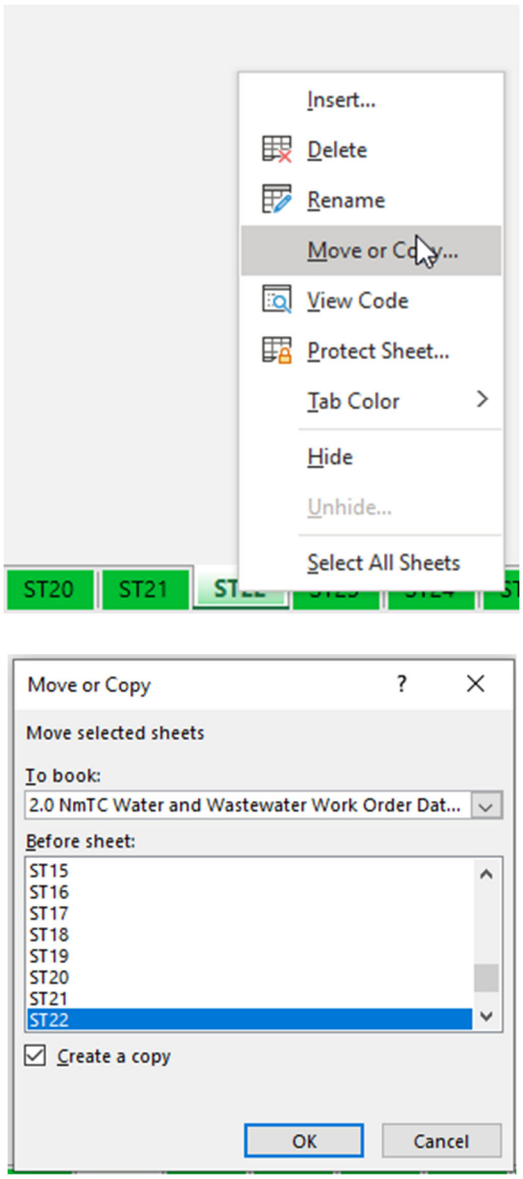


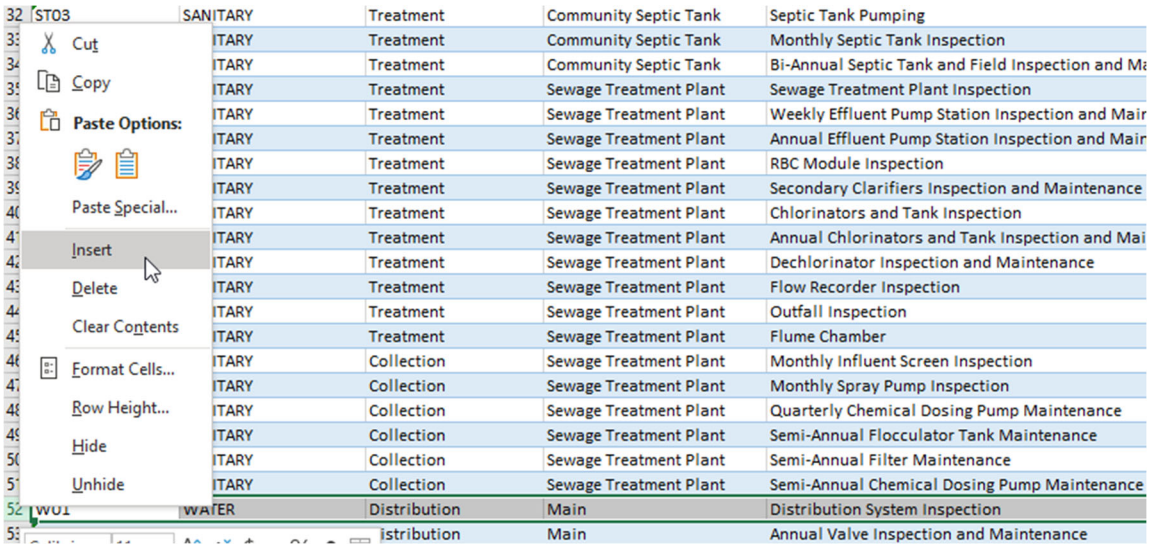
Figure 17 - Copying Tab in Work Order Database

b. Right click the copied tab to rename to the new work order number. Update the instructions/details of the new work order.

2. Update Water and Wastewater Workbook:

a. Open the **NmTC MMP Water and Wastewater Workbook.xls**

b. Insert new line in the **ii. WO Data Masterlist** tab within the relevant asset group/asset subgroup. Highlight the row beneath, right click and select “insert”.



32	ST03	SANITARY	Treatment	Community Septic Tank	Septic Tank Pumping
33		ITARY	Treatment	Community Septic Tank	Monthly Septic Tank Inspection
34		ITARY	Treatment	Community Septic Tank	Bi-Annual Septic Tank and Field Inspection and Ma
35		ITARY	Treatment	Sewage Treatment Plant	Sewage Treatment Plant Inspection
36		ITARY	Treatment	Sewage Treatment Plant	Weekly Effluent Pump Station Inspection and Mair
37		ITARY	Treatment	Sewage Treatment Plant	Annual Effluent Pump Station Inspection and Mair
38		ITARY	Treatment	Sewage Treatment Plant	RBC Module Inspection
39		ITARY	Treatment	Sewage Treatment Plant	Secondary Clarifiers Inspection and Maintenance
40		ITARY	Treatment	Sewage Treatment Plant	Chlorinators and Tank Inspection
41		ITARY	Treatment	Sewage Treatment Plant	Annual Chlorinators and Tank Inspection and Mai
42		ITARY	Treatment	Sewage Treatment Plant	Dechlorinator Inspection and Maintenance
43		ITARY	Treatment	Sewage Treatment Plant	Flow Recorder Inspection
44		ITARY	Treatment	Sewage Treatment Plant	Outfall Inspection
45		ITARY	Treatment	Sewage Treatment Plant	Flume Chamber
46		ITARY	Collection	Sewage Treatment Plant	Monthly Influent Screen Inspection
47		ITARY	Collection	Sewage Treatment Plant	Monthly Spray Pump Inspection
48		ITARY	Collection	Sewage Treatment Plant	Quarterly Chemical Dosing Pump Maintenance
49		ITARY	Collection	Sewage Treatment Plant	Semi-Annual Flocculator Tank Maintenance
50		ITARY	Collection	Sewage Treatment Plant	Semi-Annual Filter Maintenance
51		ITARY	Collection	Sewage Treatment Plant	Semi-Annual Chemical Dosing Pump Maintenance
52	W01	WATER	Distribution	Main	Distribution System Inspection
53		istribution		Main	Annual Valve Inspection and Maintenance

Figure 18 – Work Order Data Masterlist - Inserting New Row

c. Assign next sequential work order number and populate component, task description, frequency, quantity, and estimated hours and cost data.

d. Refresh the **2. REQUIRED WORK ORDERS** tab.

e. Consider uploading new work order to the **NmTC Library of Maintenance Practices.**

2.3. DRAWINGS AND MAINTENANCE MANUALS

All relevant drawings and maintenance manuals should be listed in the MMP and included as attachments where possible. As previously noted, as-constructed drawings are often available through First Nation records but can also be obtained through ISC (for registered assets) and sometimes through the engineering firm that designed the system.

Maintenance Manuals for Mechanical and Electrical system components should be provided by the contractor upon construction completion. These manuals should be thoroughly reviewed and maintenance information pertinent to each system should be added to the respective Work Order documents.

The following procedure describes how and where to include this information in the MMP.

1. List all relevant As-Constructed drawings in **MMP Section 3, Table 1**. (reference document **NmTC MMP Template.xls**). See **Figure 19**, below, for a screenshot of **MMP Section 3**. Full drawing sets should be digitally stored in an accessible and clearly labeled file.

2. List all relevant Maintenance Manuals in **MMP Section 2, Table 2**. Full maintenance manuals should be digitally stored in an accessible and clearly labeled file.

3. Available As-Constructed Drawings and Component Maintenance Manuals

Table 1 - Available Drawings - Water and Wastewater

DRAWING SET NAME	ENGINEER/DESIGNER	DATE
Reserve No. 1 Roads and Services – 5517-003	First Engineering Ltd.	June 1988
Reserve No. 1 Municipal Services Upgrading	Engineering and Associates Ltd.	July 1985
Waterfront Road Watermain Realignment	First Engineering Ltd.	November 1995
Subdivision Key Plan	First Engineering Ltd.	July 1995
Community Centre Site Servicing Plan	Community Architects Ltd.	May 1997
Nation Water Reservoir Addition	First Engineering Ltd.	November 1998
Water Water Works Improvements	First Engineering Ltd.	October 1999
Sanitary System Improvements	First Engineering Ltd.	October 1999
Municipal Upgrading – Water System - Proposed	Engineering & Associates Ltd.	July 1983
Community Health Centre Record Drawings	Community Architects Ltd.	September 2005

Table 2 - Maintenance Manuals - Water and Wastewater

MAINTENANCE MANUAL TITLE	ENGINEER/DESIGNER	DATE
Sewage Collection and Disposal System Operation and Maintenance Manual	Johnson & Associates Ltd.	June 1989
Water Works Operation and Maintenance	First Engineering Ltd.	February 1997

Figure 19 – Screenshot of Sample Maintenance Management Plan - Section 3

Relevant drawing and Maintenance Manual information should also be referenced in applicable work orders. The following procedure describes how and where to include this information in the Work Order.

1. List all relevant As-Constructed drawings in the “Reference Document” section of applicable work orders (see **Figure 20**, below). Note that a single drawing set will likely be referenced on multiple work orders. Add component specific maintenance information to Work Order document.

2. Include component specific maintenance information found in component maintenance documents to the Work Description (see **Figure 21**, below)

WORK ORDER **W01**

ASSET		ORDER DATE	
ASSET GROUP	WATER	PO#	
ASSET SUBGROUP	Supply / Distribution	START DATE	END DATE
ASSET COMPONENT	Main		
TASK DESCRIPTION	Monthly Distribution System Inspection	RECEIVED BY:	
FREQUENCY	Monthly (est. 0.3 hr/km of watermain)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly inspection of distribution system
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Valve wrench set, Valve pick
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	$ -

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

Figure 20 - Example Work Order (Front)

WORK ORDER **W01**

WORK DESCRIPTION

❑ Walk or drive along all watermain rights-of-way and check for signs of dampness, or accumulation of water or ice, which may indicate leakage.
❑ Check that all hydrants and standpipes are straight up and down. Clear any vegetation around them to make them easily visible/accessible.
❑ Check that all valve box lids, hydrant caps, and other appurtenances are in place. Set back in place if missing, repair damage.
❑ Locate and expose all valve boxes. Open alll valve box lids to ensure they are accessible. Check all main valves and ensure valve stem is vertical. Movement of valves could indicate failure due to fracture or misalignment.
❑ Close and open main valves and check for leaks. After operating each valve ensure that it is left in its normal operating position.
❑ Record locations of any new main valves and services on as-built drawings and O&M manual
❑ Survey the residents to check for leaks, lack of pressure, dirty water, and water taste (chlorine)
❑ Note any signs of excessive water usage.

COMPLETION NOTES

❑ Updated Maintenance Logs and Inspection Forms

COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

Figure 21 - Example Work Order (Back)

2.4. HEALTH AND SAFETY POLICIES AND PROCEDURES

Some water and wastewater system components are subject to standard health and safety policies such as confined space entry. It is important to include all relevant health and safety policies in the MMP and on applicable work orders. The following steps describe the location and procedure for entering H&S policies in the MMP and on applicable Work Orders.

1. List all relevant Health and Safety Policies and Procedures in **MMP Section 4, Table 3**. (reference document **NmTC MMP Template.xls**). H&S policies should be included in the table for each asset for which they apply. This could mean the policy is repeated more than once. Full policies should be digitally stored in an accessible and clearly labeled file.

4. Health and Safety Policies

Table 3 - Health and Safety Policies

ASSET	HEALTH AND SAFETY POLICY	REFERENCE DOCUMENT
WATER	OHS Guidelines Part 4: General Conditions • Working Alone or In Isolation • Ergonomics (MSI) Requirements	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-04
WATER	OHS Guidelines Part 8: Personal Protective Clothing and Equipment	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-08
WATER	OHS Guidelines Part 18: Traffic Control	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-18
SANITARY	OHS Guidelines Part 4: General Conditions • Working Alone or In Isolation • Ergonomics (MSI) Requirements • Illumination	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-04
SANITARY	OHS Guidelines Part 8: Personal Protective Clothing and Equipment	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-08
SANITARY	OHS Guidelines Part 9: Confined Spaces	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-09
SANITARY	OHS Guidelines Part 18: Traffic Control	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-18

Figure 22 – Screenshot of Sample MMP Section 4, Health and Safety Policies

2. Add component specific Health and Safety information to every Work Order document for which the H&S policy applies. Multiple work orders might require the same H&S policy, and individual work orders might have multiple H&S policies. (see **Figure 22**, above).

It is important to note that workplace safety for all staff and employed maintenance personnel is an employer responsibility. All maintenance should be conducted with Occupational Health & Safety in mind by all parties. It is recommended all Communities have a designated qualified trained Safety Officer.

WorkSafeBC has jurisdiction over the OH&S of employers operating in B.C. until it can be established otherwise. With respect to organizations involving First Nations people or located on a reserve, the federal government, and not WorkSafeBC, will have jurisdiction over:

- *Activities undertaken by an Indian band or band council, or an organization that is operated directly by or closely integrated with an Indian band or band council, that are related to the administration or governance of the band or the reserve.*

- *An organization that is engaged in activities that are closely connected with Indian status, rights or identity.*

Maintenance operations for water and sanitary infrastructure are related to the administration of the reserve and therefore fall under federal safety jurisdiction. The Canada Occupational Health and Safety Regulations can be accessed via the following link:

https://laws-lois.justice.gc.ca/eng/regulations/Sor-86-304/index.html

Jurisdiction remains with WorkSafeBC where the operations in question are not linked to Nation administration or status, rights or identity. Ordinary commercial operations will fall under Board jurisdiction, even where the workers or owners of the business are Indigenous, or the business is located on a reserve. A Board prevention officer faced with the assertion that OH&S enforcement infringes an First Nation or treaty right should refer the matter to his or her manager.

For additional information, please refer to the WorkSafe BC website regarding Guidelines for the Workers Compensation Act:

https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-for-workers-compensation-act

2.5. REGULATIONS AND POLICIES/PERMITS

Water and Wastewater systems in British Columbia are subject to a number of standard regulations, permits, and policies which should be understood prior to performing maintenance activities.

1. List all relevant Regulations and Policies/Permit Information in MMP Section 4, Tables 4 and 5. (reference document **NmTC MMP Template.xls**). Full Policies and Regulations should be digitally stored in an accessible and clearly labeled file.

2. Add component specific Regulations and Policies/Permit information to Work Order document (see **Figure 20**, above).

In terms of wastewater, First Nation organizations fall under the GoC Department of the Environment. A link to the Government of Canada Wastewater System Effluent Regulations is provided here:

https://laws-lois.justice.gc.ca/eng/regulations/sor-2012-139/fulltext.html

Guidelines for potable water are provided under the Safe Drinking Water for First Nations Act, available at the following link:

https://www.sac-isc.gc.ca/eng/1330528512623/1533729830801

Under the Safe Drinking Water for First Nations Act, treatments standards for drinking water quality are based on the Canadian Drinking Water Guidelines, linked here:

https://www.canada.ca/en/health-canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html

2.6. DEVELOP MAINTENANCE MANAGEMENT BUDGET

The Annual Budget is an estimate of labour and material expenses for scheduled annual maintenance tasks. Budgets developed through this guidebook can be inserted into overall operations and maintenance budgets and provide communities with an estimate of funds and effort required to complete recommended preventative maintenance on community assets.

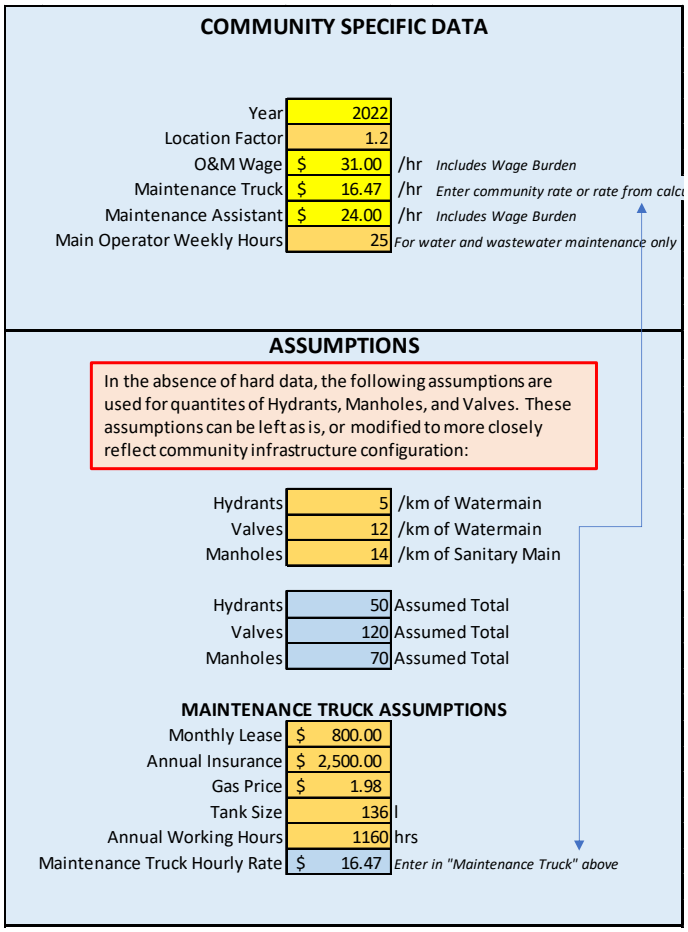
The Annual Budget projects the Operation and Maintenance costs for Water and Wastewater infrastructure including:

- An estimate of the annual cost of routine maintenance by O&M staff based on community-specific labour rates;
- An estimate of the annual cost for external maintenance contractors;
- An estimate of operating costs including equipment, parts and materials, and energy costs.

2.6.1. Preparing An Annual Maintenance Budget

The Annual Maintenance Budget is determined by the community-specific work orders selected in Section 2.4.1. The following steps walk through the development of an Annual Maintenance Budget.

1. Open the **NmTC MMP Water and Wastewater Workbook.xls** document. Ensure the "Community Specific Data" including O&M wage and maintenance truck assumptions are complete on the "Table of Contents" tab.



COMMUNITY SPECIFIC DATA

Year	2022		
Location Factor	1.2		
O&M Wage	$ 31.00	/hr	*Includes Wage Burden*
Maintenance Truck	$ 16.47	/hr	*Enter community rate or rate from calcu*
Maintenance Assistant	$ 24.00	/hr	*Includes Wage Burden*
Main Operator Weekly Hours	25		*For water and wastewater maintenance only*

ASSUMPTIONS

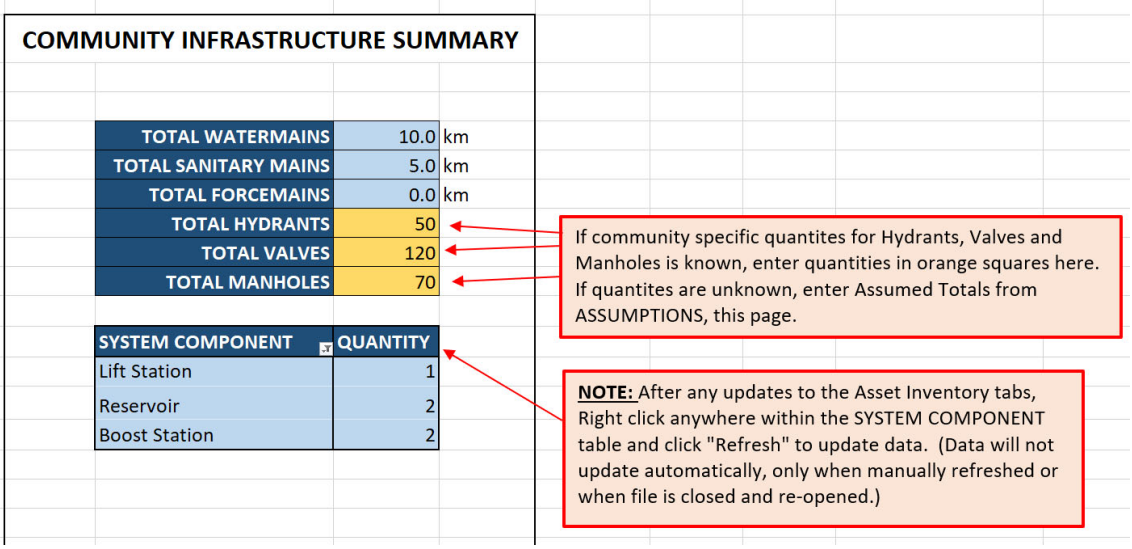
In the absence of hard data, the following assumptions are used for quantites of Hydrants, Manholes, and Valves. These assumptions can be left as is, or modified to more closely reflect community infrastructure configuration:

Hydrants	5	/km of Watermain
Valves	12	/km of Watermain
Manholes	14	/km of Sanitary Main
Hydrants	50	Assumed Total
Valves	120	Assumed Total
Manholes	70	Assumed Total

MAINTENANCE TRUCK ASSUMPTIONS

Monthly Lease	$ 800.00	
Annual Insurance	$ 2,500.00	
Gas Price	$ 1.98	
Tank Size	136	l
Annual Working Hours	1160	hrs
Maintenance Truck Hourly Rate	$ 16.47	*Enter in "Maintenance Truck" above*

2. Ensure the “SYSTEM COMPONENT” table is refreshed by right clicking anywhere on the table and selecting “Refresh”.



COMMUNITY INFRASTRUCTURE SUMMARY

TOTAL WATERMAINS	10.0	km
TOTAL SANITARY MAINS	5.0	km
TOTAL FORCEMAINS	0.0	km
TOTAL HYDRANTS	50	
TOTAL VALVES	120	
TOTAL MANHOLES	70	

SYSTEM COMPONENT	QUANTITY
Lift Station	1
Reservoir	2
Boost Station	2

If community specific quantites for Hydrants, Valves and Manholes is known, enter quantities in orange squares here. If quantites are unknown, enter Assumed Totals from ASSUMPTIONS, this page.

NOTE: After any updates to the Asset Inventory tabs, Right click anywhere within the SYSTEM COMPONENT table and click "Refresh" to update data. (Data will not update automatically, only when manually refreshed or when file is closed and re-opened.)

3. Open Tab **4. WORK ORDERS** in the **NmTC MMP Water and Wastewater Workbook.xls** document. Right click within the blue table and select "Refresh" to ensure the table is up to date. The WORK ORDER column lists all suggested work orders for the inventoried assets.

4. Select the WORK ORDER column and copy data. (Right click selected column and choose Copy – see Figure 23)

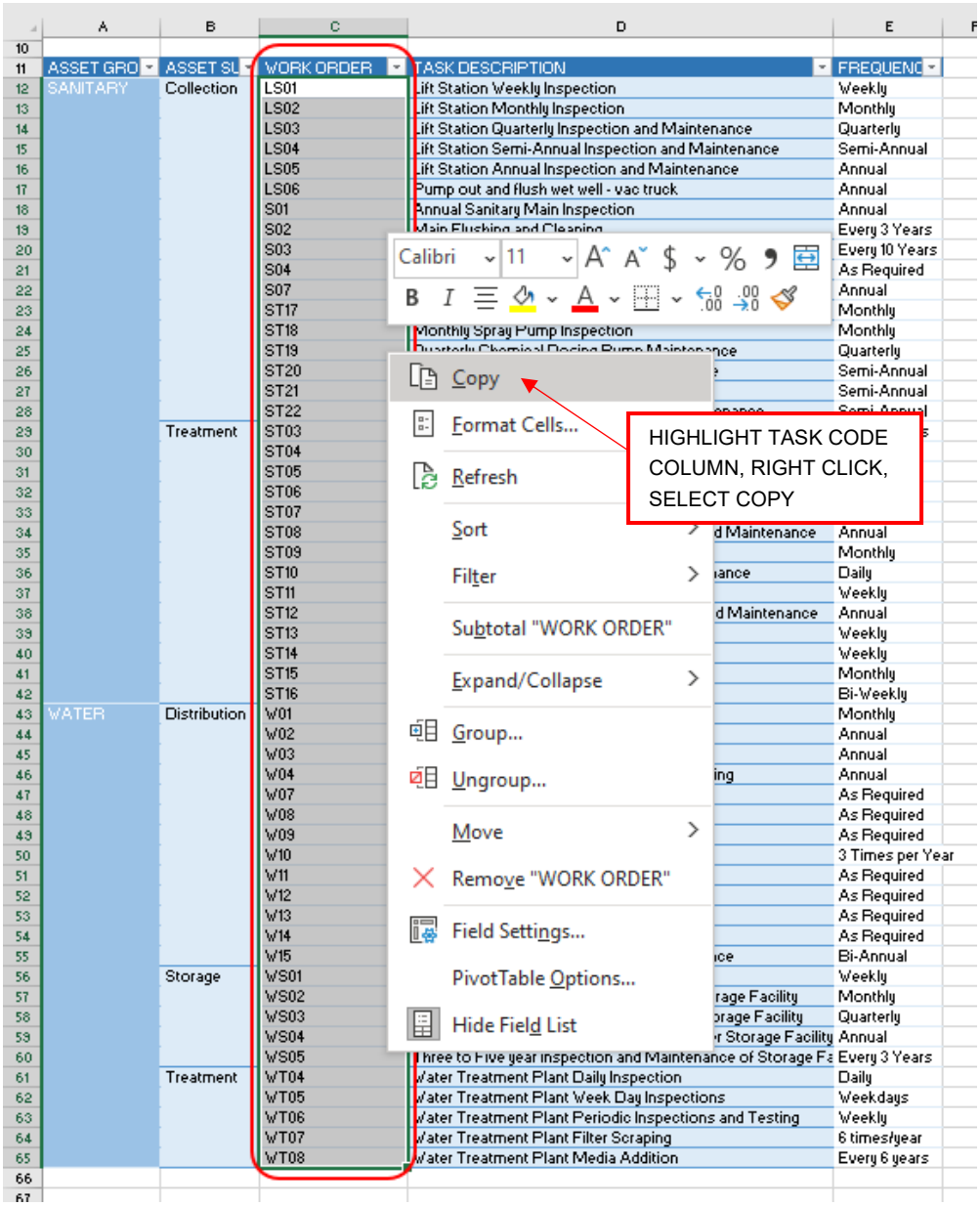
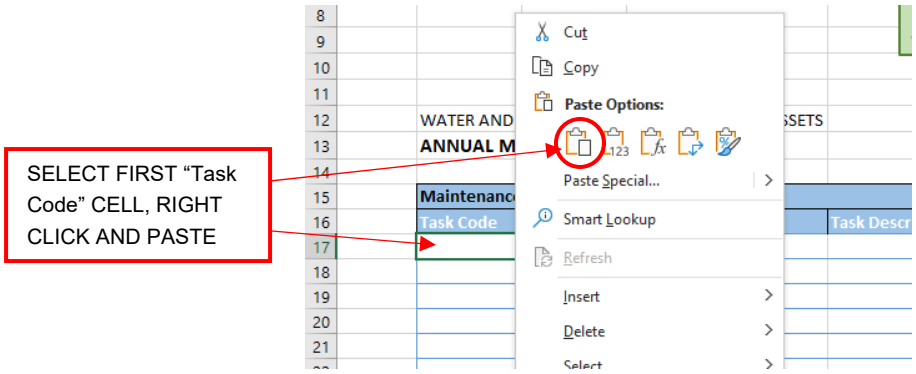


Figure 23 - Copy Work Order Codes

5. Open **Tab 6: Budget** in the **NmTC MMP Water and Wastewater Workbook.xls** document. Paste the task codes copied from Tab 4 into the Task Code column of the Budget Table.



6. Asset Group, Asset Component, Description, Frequency, Crew Hours, Contractor budget, Equipment, and Parts & Materials, Energy and Annual Budget Fields will populate automatically. Refer to **Figure 24** below for an excerpt from the **6.Budget** tab of the Example excel Workbook provided.

Upon Completion, the annual budget for each maintenance activity is determined and a total annual budget is projected – See **Figure 24**. A complete budget example is included in the Example MMP as Appendix A. The excel Workbook associated with the Example MMP also accompanies this guide.

Naut'sa mawt TRIBAL COUNCIL

Instructions:
Enter desired work order(s) in the "Task Code" column. All remaining columns will populate with information from the "ii. WO Data Masterlist" tab.

Notes and Assumptions:
This Budget calculates the total annual cost based on quantity of each system component inventoried, as noted in the ***"Community Infrastructure Summary"*** *on the Table of Contents.*

Return to Table of Contents

Labour Rates	
Labour	$ 31.00
Truck	$ 16.47

TOTAL ANNUAL BUDGET	
Operator	*$ 64,926.21*
Truck	*$ 13,125.55*
Contractor	*$ 5,078.33*
Equipment	*$ 22,326.67*
Parts & Materials	*$ 2,752.44*
Energy Requirements	*$ 37,000.00*
TOTAL O&M	**$ 145,209.19**

WATER AND WASTEWATER INFRASTRUCTURE ASSETS
ANNUAL MAINTENANCE BUDGET

Maintenance Task					Crew Hours per Year		Costs per Task				
Task Code	Asset Group	Asset Component	Task Description	Frequency	Operator	Truck	Contractor	Equipment	Parts & Materials	Annual Energy Cost	Annual Budget
LS01	SANITARY	Lift Station	Lift Station Weekly Inspection	Weekly	120	120	$ -	$ 50.00	$ 3.00	$ -	$ 12,055.99
LS02	SANITARY	Lift Station	Lift Station Monthly Inspection	Monthly	36	24	$ -	$ 50.00	$ 3.00	$ -	$ 2,783.20
LS03	SANITARY	Lift Station	Lift Station Quarterly Inspection and Maintenance	Quarterly	18	6	$ 50.00	$ 150.00	$ 3.00	$ -	$ 1,874.80
LS04	SANITARY	Lift Station	Lift Station Semi-Annual Inspection and Maintenance	Semi-Annual	18	3	$ 50.00	$ 100.00	$ 3.00	$ -	$ 1,066.40
LS05	SANITARY	Lift Station	Lift Station Annual Inspection and Maintenance	Annual	24	3	$ 600.00	$ 900.00	$ 3.00	$ 3,900.00	$ 9,202.40
LS06	SANITARY	Lift Station	Pump out and flush wet well - vac truck	Annual	3	3	$ -	$ -	$ 3.00	$ -	$ 151.40
S01	SANITARY	Main	Annual Sanitary Main Inspection	Annual	21	21	$ 50.00	$ 200.00	$ 2.54	$ -	$ 1,264.41
S02	SANITARY	Main	Main Flushing and Cleaning	Every 3 Years	10	10	$ 75.00	$ -	$ 2.54	$ -	$ 492.09
S03	SANITARY	Main	CCTV Inspection	Every 10 Years	1	1	$ -	$ -	$ 2.54	$ -	$ 29.13
S04	SANITARY	Main	Vac Truck	As Required	0	0	$ -	$ -	$ 2.54	$ -	$ 2.54

Figure 24 - Workbook Example - Tab 6. BUDGET

It is important to note that cost projections provided in this guide have been developed based on similar operations and maintenance activities on Vancouver Island, but should be refined as soon as community-specific information becomes available.

2.7. DEVELOP MAINTENANCE MANAGEMENT SCHEDULE

The Annual Maintenance Schedule is a road map of routine, scheduled maintenance tasks required to maintain community assets on an annual basis. The Annual Maintenance Schedule contains a list of all inspection and prevention maintenance tasks including:

- Maintenance activities listed beside numbered work orders - grouped to indicate the work required for each asset group;
- Person-hours for each activity shown weekly with a summary of total hours for the year;

2.7.1. Preparing An Annual Maintenance Schedule

The Annual Maintenance Schedule is determined by the community-specific work orders selected in Section 2.4.1. The following steps walk through the development of an Annual Maintenance Budget.

- Open **Tab 5: Schedule** in the **NmTC MMP Water and Wastewater Workbook.xls** document.
- Paste all applicable work order codes into the “Task Code” column (green). Work Order Code entry will populate the Task Description, Frequency, and Crew Hours per Year fields. Refer to **Figure 25** below for an excerpt from the **5.Schedule** tab of the excel Workbook provided.

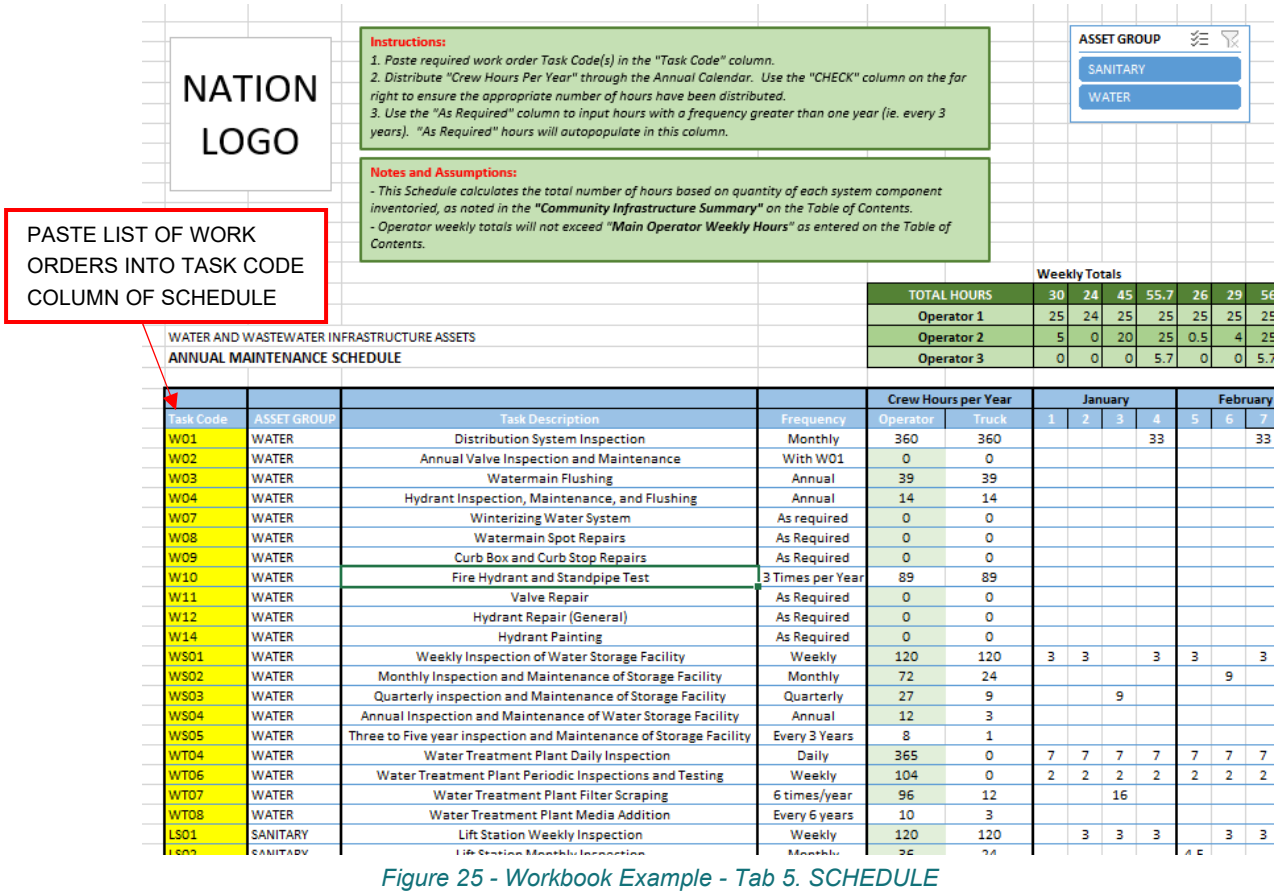


Figure 25 - Workbook Example - Tab 5. SCHEDULE

- Distribute crew hours throughout the year. Note the frequency of the task in distribution of hours – for example, if task ST19 is a quarterly task with a total of 8 hours per year, it should be entered into the schedule as four 2-hour tasks. Each individual community is best suited to determine the most appropriate time of year to schedule their maintenance activities to suit crew availability and other nation-specific constraints. The "Weekly Totals" at the top of the schedule can help determine which weeks throughout the year are task heavy, and aid in the even distribution of hours. Some tasks such as watermain flushing are seasonally dependant - it would not be advisable to schedule flushing during periods of hot dry weather when water supply is lower and fire risk increases. When budgeting hours for staff, remember that available hours for staff must not include vacation, statutory holidays, average sick days, training days, and other non "hands-on" work time. For context, only 80% - 85% of paid hours are typically available for "hands-on" maintenance. Weekly totals for Operator 1, 2, and 3 in the green "Weekly Totals" rows will not exceed the "Main Operator Weekly Hours" entered in the **Table of Contents** Tab. Adjust max weekly operator hours as required on the Table of Contents Tab.



The database has been developed with consideration given to assets with multiple inspection and maintenance tasks scheduled at various frequency. For example, Lift Station inspections include weekly, monthly, quarterly, semi-annual, and annual inspections. In order to avoid overlap, the Annual Inspection is conducted in conjunction with one of the semi-annual inspections, the semi-annual inspections are conducted in conjunction with two of the quarterly inspections, the quarterly inspections are conducted in conjunction with four of the monthly inspections, and the monthly inspections are conducted in conjunction with 12 of the weekly inspections. This distribution of tasks is indicated on tab ii. WO Data Masterlist by pink highlighted cells.

ASSET SUBGROUP	ASSET COMPONENT	TASK DESCRIPTION	FREQUENCY	FREQUENCY (TIMES PER YEAR)
Collection	Main	Annual Sanitary Main Inspection	Annual	1
Collection	Main	Main Flushing and Cleaning	Every 3 Years	0.33
Collection	Main	CCTV Inspection	Every 10 Years	0.10
Collection	Main	Vac Truck	As Required	1
Collection	Forcemain	Annual Forcemain Inspection	Annual	1
Collection	Backflow Preventor	Annual Backflow Preventor Inspection and Maintenance	Annual	1
Collection	Air Release Valve	Annual Sanitary Air Release Valve Inspection and Maintenan	Annual	1
Collection	Lift Station	Lift Station Weekly Inspection	Weekly	40
Collection	Lift Station	Lift Station Monthly Inspection	Monthly	8
Collection	Lift Station	Lift Station Quarterly Inspection and Maintenance	Quarterly	2
Collection	Lift Station	Lift Station Semi-Annual Inspection and Maintenance	Semi-Annual	1
Collection	Lift Station	Lift Station Annual Inspection and Maintenance	Annual	1
Collection	Lift Station	Pump out and flush wet well - vac truck	Annual	1

Figure 26 - Frequency of Maintenance Tasks

Upon completion, weekly crew hours for the duration of the year are projected and a total annual maintenance effort can be determined. A sample schedule is available for reference in the Example MMP, included as Appendix A.



3.STEP 3: Implement Maintenance Management Plan

Supplementary Documents Required from NmTC Toolkit:

- **NmTC MMP Template.xls**
- **NmTC MMP Water and Wastewater Workbook.xls**
- **NmTC Water and Wastewater Work Order Database.xls**

The Maintenance Management Plan developed through this guide is intended as a launch pad to sustainable asset management. As each community advances their asset management proficiency, the plan developed herein will evolve into an invaluable tool for community operations and future planning. Through proper implementation the MMP can assist in lowering operating costs, reducing downtime, increasing performance, maximizing life expectancy of infrastructure systems, improving resource utilization, maintaining the value of the asset and aiding in budget forecasting.

The steps involved in successful implementation of the MMP are detailed below. It is expected that while some communities may be just beginning their Asset Management journey, others may already have well established Asset Management systems. Not all steps may be relevant to all communities, as some may be well on their way through this process. For those communities, it is hoped that this guide can build on systems that are already in place to further progress and refine Asset Management practices.

- Secure Qualified Staff and Contractors to implement the adopted Maintenance Management Plan according to the adopted Schedule.
- Get Budget Approval
- Determine Information Management Process
- Implement Work Orders
- Follow-up on Work Orders
- Update Relevant Records

3.1. SECURE QUALIFIED STAFF AND CONTRACTOR

Purpose:

Secure sufficient, qualified staff and contractors to implement the adopted Maintenance Management Plan according to the Adopted Schedule.

Inputs:

- ❑ Maintenance work orders;
- ❑ Relevant regulations, policies, procedures & permits that apply to skills and qualifications for asset maintenance;
- ❑ FN HR policy and requirements;
- ❑ FN records on staffing – skills, working hours, relevant job descriptions;
- ❑ List of qualified contractors for typical maintenance work;

Approach:

Effective maintenance requires an appropriate combination of skilled and semi-skilled labour. For example, some electrical and mechanical tasks must be done by qualified trades; water systems and sewage treatment systems require operators that are qualified under the Environmental Operators Certification Program (EOCP); Worksafe B.C. requires that staff be qualified for confined space entry.

The approach to securing qualified staff and contractors generally involves:

- Review each work order and determine the skills and qualifications required to perform each task;
- Accumulate labour hours for each skill category;
- For work to be done by in-house FN staff:
    - Determine if the FN has sufficient staff with the right skills to do necessary work when required - identify and quantify gaps in available skills and staff hours
    - Decide if skill gaps can be sufficiently addressed by skill development and formal training; also, can skill development occur in time to suit the maintenance schedule;
        - if yes to both, proceed with skill development
        - If yes, but not in sufficient time, proceed with skill development for future work; in the meantime, issue short term contracts
        - If no to both, include scope in work to be contracted out

- For work to be done by contractors:
    - Where practical, package work to be contacted-out according to key skill requirements - e.g. qualified mechanic, electrician or plumber; EOCP certified operator; general labour (semi-skilled); labourer (unskilled);
    - Prepare scope and terms of reference for each package to be contracted out - each package should have a clear, well defined scope of work and specifics on the Nation's expectations in terms of skills, qualifications and work procedures;
    - Secure and evaluate proposals from qualified contractors; ask for and contact relevant references;
    - Award work to the preferred, qualified contractor;

Outputs:

- ❑ A team of sufficient, qualified staff and contractors to implement the adopted Maintenance Management Plan according to the adopted schedule.

Tips and Tricks:

- When reviewing work orders, apply consistent skill categories and accumulate labour hours for each category – e.g. EOCP certified operator; general labour (semi-skilled); labourer (unskilled) – this will make it easier to determine internal staffing and to issue contracts for packages of work, thereby saving time and reducing costs;
- Available labour hours for staff = annual paid hours less vacation, statutory holidays, average sick days, training days and other non-"hands on" work time – for context, only 80% to 85% of paid hours are typically available for "hands on" maintenance;
- The lowest cost contractor is not necessarily the best contractor – FN's should consider a variety of factors including quality of work, efficiency, ability to "get along" and communication skills;
- Where appropriate, long term relationships with contractors can improve efficiency through accumulated knowledge of the FN and its systems; "known faces" can also streamline interactions with residents and businesses.

3.2. ADOPT NECESSARY POLICIES & PROCEDURES

Purpose:

- *Put policies and procedures in place to enable effective implementation of the adopted Maintenance Management Plan and Schedule.*
- *Promote clarity, consistency and transparency on maintenance management roles, responsibilities, plans and activities.*

Inputs:

- ❑ MMPs and maintenance work orders;
- ❑ Relevant existing regulations, policies, procedures & permits that apply to asset maintenance;
- ❑ Current FN CISP

Approach:

The Community Infrastructure Services Planning (CISP) process is geared to integrating all aspects of infrastructure management, including identifying necessary policies and procedures – e.g. technical, financial and operational. In particular, the CISP is geared to achieving the lowest life-cycle cost for asset management; effective maintenance is key to that process.

As such, establishing appropriate policies and procedures for maintenance should be considered as an integral part of the overall process to ensure that requirements for maintenance are appropriately considered with other aspects of asset management. To that end:

- Review all work orders, related tasks and procedures – identify policy guidance, if any, required from FN leadership;
- Through discussions with FN leadership. determine if there is already relevant, existing policy:
    - If so, reference it in the MMP and relevant work orders and apply it to work procedures;
    - If not, agree the process (who, what and when) to develop and apply appropriate policies;
    - Agree how to handle policy requirements in the short term while appropriate policy is developed.

Outputs:

- ❑ Relevant policies and procedures that apply to all maintenance work.

Tips and Tricks:

- Appropriate policies and procedures can improve clarity and consistency among stakeholders (leadership, staff, contractors, residents); they can also reduce conflict and costs by avoiding misunderstandings and confusion;

- FNs should have an appropriate Asset Management Policy that covers all aspects of infrastructure management, including maintenance – a sample Policy is available in the NmTC Community of Practice Toolkit.

3.3. ADOPT MAINTENANCE BUDGET

Purpose:

- *Establish necessary revenues and expenditures to implement the adopted Maintenance Management Plan.*

Inputs:

- ❑ FN Finance Administration Law (FAL) and related FN budget policies and procedures
- ❑ Draft maintenance budget – see Step 2.5
- ❑ Relevant regulations, policies, procedures & permits that apply to asset maintenance;
- ❑ Prior year's budget, actual costs and revenues
- ❑ MTSA agreements (if any)
- ❑ Other funding agreements

Approach:

Step 2.5 describes how to prepare the draft annual maintenance budget. Once developed, the Nation must submit the draft to its normal process for budget approval – typically as set out in the Nation's Finance Administration Law (FAL). Such process usually involves input by appropriate FN Council Committees, FN Council and FN members.

The budget process usually involves:

- Submitting the draft maintenance budget for consideration by Council and Committees
- Adjusting the draft budget according to Council and Committee direction, including:
    - Budget increases or reductions to address requests for expanded or reduced scope of work;
    - Budget adjustments to accommodate Nation-wide financial requirements – e.g. reduced revenues expected; re-allocation of funds to programs of higher priority
- Approval of the adjusted scope of work and budget, including any adjustments to staffing and related resources

Outputs:

- ❑ Approved maintenance budget
- ❑ Approved scope of maintenance to be carried out during the fiscal year

Tips and Tricks:

- Be specific when communicating the impact of requested budget adjustments. For example, if Council requests a 5% reduction, specify the work that won't get done if that reduction is approved and the impact on overall infrastructure performance and costs – for example, reduced maintenance leads to increased wear and tear and higher costs for breakdowns vs. planned maintenance.

- Be sure to get approval for any staff adjustments at the time of budget approval – don't get caught with either too many or too few staff to do the approved work;

- Be clear with Council that, just because the current year budget wasn't fully spent, it doesn't mean that next year's budget should be any less – for example, while typical maintenance budgets are based on estimates, actual requirements can vary from year to year due to weather, staffing issues and availability of parts – when submitting the draft budget, be clear and specific on any current year budget variances and their impact on next year's budget.

- Adjust all relevant work orders – scope and schedule – according to the approved budget. For example, due to budget reductions, inspections may have to be done annually vs. monthly; some maintenance work may have to be deferred to future years.

- Monitor and report on infrastructure performance – operational and cost; in particular, highlight any changes in performance arising from budget increases or reductions such that Council becomes aware of the cause-effect of budget decisions.

3.4. IMPLEMENT EFFECTIVE INFORMATION MANAGEMENT

Purpose:

- *Implement effective systems and practices for recording and managing asset and maintenance information.*
- *Promote effective implementation of maintenance work orders and follow up.*
- *Enable effective links between maintenance and related asset management and financial management activities – e.g. capital planning and tangible capital asset reporting.*

Inputs:

- ❑ Current MMP and work orders for all maintenance tasks for all infrastructure systems
- ❑ Current FN CISP
- ❑ Relevant regulations, policies, procedures & permits that apply to asset maintenance, including FN policies for HR, payroll, accounting and information management (e.g. archive requirements)
- ❑ FN Finance Administration Law (FAL) and related FN financial policies and procedures
- ❑ MTSA agreements (if any)
- ❑ Other ISC funding agreements
- ❑ User fee agreements
- ❑ "As built" construction records
- ❑ Asset Condition Reporting System (ACRS) reports
- ❑ ICMS records
- ❑ Field surveys and measurements
- ❑ Financial records, including budget
- ❑ Maintenance records
- ❑ Design briefs & specifications
- ❑ Tender documents
- ❑ Procurement records
- ❑ "As built" construction records
- ❑ Commissioning records, including operating manuals

Approach:

The Community Infrastructure Services Planning (CISP) process integrates requirements for information management processes and systems to support the technical, financial and operational aspects of asset management. As such, establishing appropriate information management for maintenance should be an integral part of the overall process to ensure that all requirements are appropriately considered.

On this basis, the approach for information management usually involves:

- Establishing an information "needs assessment" - review the MMP and related work orders to identify and document information needs, including the type and format of information required for developing and implementing: MMPs and work orders; the asset inventory; asset and maintenance records; the maintenance budget; compliance reporting; and maintenance reporting;

- Engaging FN leadership to address information needs for maintenance as part of integrated information management systems – pro-actively participate in planning and design discussions to ensure that maintenance needs are appropriately met;

- "Piloting" information management processes and systems and providing input on required adjustments to achieve efficient and effective results;

- Actively applying information management processes and systems at full scale to ongoing maintenance; identifying, through operating experience, issues and gaps to be addressed through system refinements; pro-actively participating in the ongoing process for refining and improving information management.

Outputs:

- ❑ Effective information management systems and practices for managing maintenance
- ❑ Effective links between maintenance and related asset management and financial management activities

Tips and Tricks:

- Take the time needed to develop and implement effective information management, including involving all key people (FN leadership, staff from all relevant FN departments, contractors, operators, etc) to ensure that the systems work well for all affected parties

- Accurately document information management policies and procedures and, once developed, communicate them to all relevant parties; provide necessary training; having clarity and a common understanding on information management promotes efficiency and reduces errors, response times, costs and risks.

3.5. IMPLEMENT AND FOLLOW UP ON MAINTENANCE WORK ORDERS

Purpose:

- *Implement the adopted Maintenance Management Plan and Schedule through a formal, priority based work order system and procedures.*
- *Establish formal procedures for following up on issues identified through execution of maintenance work orders.*

Inputs:

- ❑ Current MMP and work orders for all maintenance tasks, including task frequency and labour hours required for each task
- ❑ Seasonal requirements for maintenance – some work can only be done at certain times of the year
- ❑ Relevant regulations, policies, procedures & permits that apply to maintenance;
- ❑ Maintenance records
- ❑ Budget and financial records
- ❑ Relevant FN HR policies and job descriptions
- ❑ Available labour hours for staff
- ❑ List of qualified, available contractors

Approach:

Implementing the MMP through work orders is a continuous cycle of planning the work, doing the work and then updating work programs and plans based on the results of doing the work as follows:

- Plan for and organize maintenance work:
    - Review all work orders to be done in the upcoming period – say 1 week or 1 month – identify necessary resources including labour, equipment, materials, contractors and external agency (e.g. Hydro, Tel) inputs
    - Contact and organize necessary resources according to the adopted maintenance schedule; confirm availability, costs and delivery times for materials
    - If resources are available on time and on budget, proceed with maintenance as planned
    - If resources are not available on time, adjust maintenance schedule by re-arranging and proceeding with maintenance tasks accordingly – see Step 2.6
    - If resources cost more than budgeted, adjust work scope and priorities, as needed, to keep overall maintenance program within budget – or, request additional funds – see Step 2.5; proceed with maintenance tasks accordingly;
- Perform maintenance according to work orders and schedule:

- Conduct maintenance according to procedures and methods in the work orders
- Submit completed work orders to the maintenance planning and records system; each completed work order should:
  - Document and scope any issues for follow up – e.g. pump needs to be replaced; cracks need to be sealed; motors need major, non-routine servicing
  - Document and scope any variances between planned and actual labour hours, materials or other resources required for routine maintenance as set out in the work order
  - Document any other issues for follow up

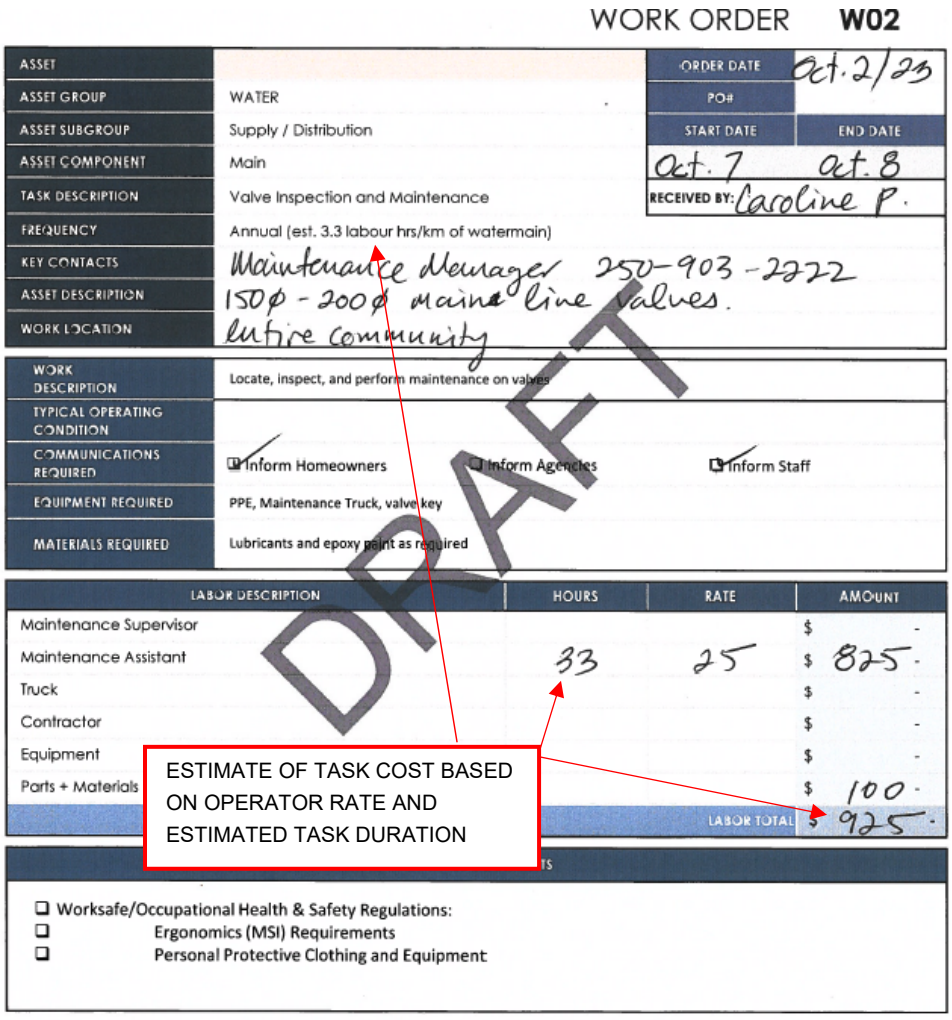
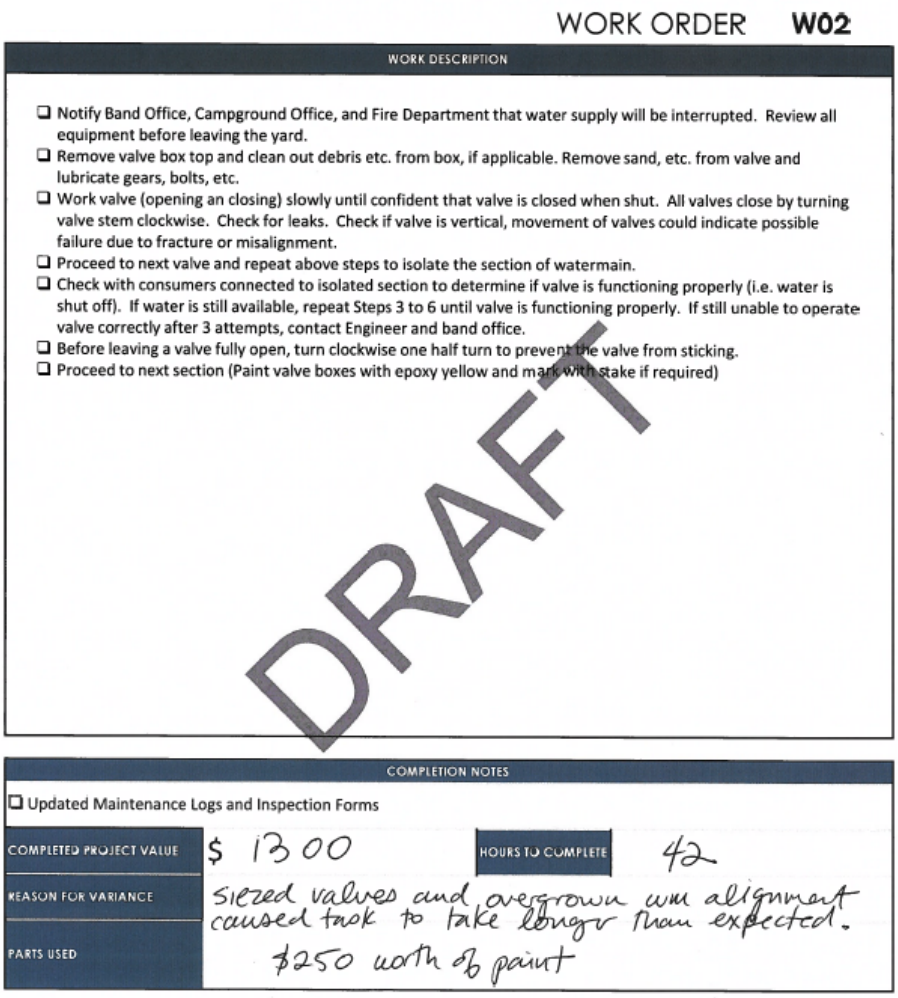


Figure 27 - Sample Work Order - Estimate of Planned Maintenance Hours



WORK ORDER **W02**

WORK DESCRIPTION

- ❑ Notify Band Office, Campground Office, and Fire Department that water supply will be interrupted. Review all equipment before leaving the yard.
- ❑ Remove valve box top and clean out debris etc. from box, if applicable. Remove sand, etc. from valve and lubricate gears, bolts, etc.
- ❑ Work valve (opening an closing) slowly until confident that valve is closed when shut. All valves close by turning valve stem clockwise. Check for leaks. Check if valve is vertical, movement of valves could indicate possible failure due to fracture or misalignment.
- ❑ Proceed to next valve and repeat above steps to isolate the section of watermain.
- ❑ Check with consumers connected to isolated section to determine if valve is functioning properly (i.e. water is shut off). If water is still available, repeat Steps 3 to 6 until valve is functioning properly. If still unable to operate valve correctly after 3 attempts, contact Engineer and band office.
- ❑ Before leaving a valve fully open, turn clockwise one half turn to prevent the valve from sticking.
- ❑ Proceed to next section (Paint valve boxes with epoxy yellow and mark with stake if required)

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COMPLETION NOTES

❑ Updated Maintenance Logs and Inspection Forms

COMPLETED PROJECT VALUE	$ 1300	HOURS TO COMPLETE	42
REASON FOR VARIANCE	seized valves and overgrown vvm alignment caused task to take longer than expected.		
PARTS USED	$250 worth of paint		

Figure 28 - Sample Work Order - Actual Project Cost and Reason for Variance

- Update maintenance plan and schedule
  - Routinely – say each week or each month – review all completed work orders and identify follow up such as:
    - Update routine labour hours, skills and other resource requirements to reflect experience from executing work orders – see Step 2.2
    - Scope and document requirements for follow up on issues identified while executing work orders, as documented on completed work orders, including: parts replacement; maintenance and replacements not covered by the regular maintenance program; follow up studies to assess issues and recommend solutions

- Refine the budget and work priorities to reflect experience in executing work orders and to accommodate scope and cost of following up on work orders – see Step 2.5

- Update the maintenance schedule (see Step 2.6) to:

    - Reflect additional or less time required for routine maintenance tasks as identified on completed work orders

    - Provide time to follow up on work identified on completed work orders

- Routinely adjust work orders to reflect changes in regulations and standards – e.g. updated health and safety requirements; updated permit or regulatory requirements

- Routinely add, delete or amend work orders to reflect asset additions, deletions and changes. At least annually, review and update the entire maintenance program including adjustments to: work orders, schedule, budget, staffing and other resource requirements; address such updating in following year's maintenance budget.

Outputs:

- ❑ Completion of maintenance according to approved plans and budgets
- ❑ Identification of issues for follow up
- ❑ Recommendations for future budgets and capital plans

Tips and Tricks:

- Take time to plan maintenance and to organize materials, supplies and contractors; lack of availability, long lead times and or conflicting schedules can increase costs and service disruptions significantly;
- Be sure to record follow up issues in the maintenance plan and to appropriately plan and execute follow up work to ensure that systems operate reliably;
- When preparing or updating MMPs, FNs should tap into the body of knowledge already available through the NmTC Community of Practice;
- Start simply and make assumptions. It'll take some time to master the approach to maintenance planning and scheduling and to fine tune estimated vs. required labour hours
- Spreadsheets and other software tools can streamline maintenance planning and scheduling
- When reviewing work orders, apply consistent skill categories and accumulate labour hours for each category – e.g. EOCP certified operator; general labour (semi-skilled); labourer (unskilled) – this will make it easier to determine internal staffing and to issue contracts for packages of work, thereby reducing costs;
- Available labour hours for staff = annual paid hours less vacation, statutory holidays, average sick days, training days and other non-"hands on" work time – for context, only 80% to 85% of paid hours are typically available for "hands on" maintenance;
- Always allow sufficient time in the maintenance schedule to follow up on regular work orders – e,g. where routine maintenance identifies repairs or replacements to be done that are not already in the schedule. Use maintenance history to estimate time allocation; otherwise, assume a percentage of total available time (e.g. 20%) and allocate it to follow up; allocate other resources accordingly; refine assumptions based on experience over

3.6. UPDATE MAINTENANCE RECORDS

Purpose:

- *Establish and sustain an accurate, up-to-date record of all maintenance practices and findings.*

Inputs:

- ❑ Current MMP and work orders for all maintenance tasks for all infrastructure systems
- ❑ Current FN CISP
- ❑ Relevant regulations, policies, procedures & permits that apply to asset maintenance, including FN policies for HR, payroll, accounting and information management
- ❑ FN Finance Administration Law (FAL) and related FN financial policies and procedures
- ❑ MTSA agreements (if any)
- ❑ Other ISC funding agreements
- ❑ User fee agreements
- ❑ "As built" construction records
- ❑ Asset Condition Reporting System (ACRS) reports
- ❑ ICMS records
- ❑ Field surveys and measurements
- ❑ Financial records, including budget
- ❑ Maintenance records
- ❑ Design briefs & specfications
- ❑ Tender documents
- ❑ Procurement records
- ❑ "As built" construction records
- ❑ Commissioning records, including operating manuals

Approach:

The form and content of:

- The Asset Inventory, including asset additions, changes and deletions, is established through Step 1.0
- Maintenance records are established as part of developing overall information management processes and systems – see Step 3.4 – including requirements for "As built" construction records and reports.
- Work orders are established through Step 2.2.

On this basis, the updating process usually involves:

- Reviewing completed work orders to identify and document necessary changes, if any, to maintenance plans and records including: the Asset Inventory, record drawings, work orders and other relevant documents that record details of infrastructure assets and how they work

- Sumitting details on necessary updates to an individual(s) authorized to execute the updates
- Recording that the updates have been executed – what, when, how and by whom
- Ensuring that all prior records are handled according to the FN's document handling policy – for example, destroying uncessary documents, archiving documents and recording that documents have been superceded and referencing the up-to-date version; in any event, the document management process should ensure clarity on current status.

Outputs:

- ❑ Up to date records on all aspects of assets and their maintenance

Tips and Tricks:

- This is truly a "garbage in, garbage out" situation – records are only truly valuable if they can be trusted as accurate;
- Much energy, time and money is spent uncessarily as a result of faulty records;
- Conflicts and confusion also arise as a result of faulty records, thereby undermining relationships
- The importance of updating records should be enshrined in the FN's organizational culture. FNs should allocate sufficient time, resources and checks and balances to ensure that records are up to date and accurate.
- It's usually wise to limit errors and to improve currency and accuracy, by limiting authority to make changes in asset and maintenance information; for example, authorize a single individual to do all information updates; alternatively, allocate authority among staff, with appropriate security clearances, according to their roles and responsibility and to the risks associated with data accuracy.

3.7. REPORT ON MAINTENANCE MANAGEMENT

Purpose:

- *Clearly and routinely communicate with key staff and decision makers on maintenance activities and findings and their implications for asset performance and life-cycle costs.*

Inputs:

- ❑ MMP and maintenance records, including planned and completed work orders
- ❑ Operational performance assessment – actual vs. target performance according to CISP key performance indicators (KPIs)
- ❑ Compliance monitoring and reporting records
- ❑ Service interruption and/or asset breakdown records
- ❑ Actual vs. budget costs and revenues
- ❑ HR records
- ❑ Capital Plan

Approach:

Routine and effective reporting is critical to engaging leadership and necessary support for maintenance. On this basis, maintenance managers should routinely report to FN leadership, at least quarterly, on, for example:

- Infrastructure performance – are assets performing as designed – if not, why not and what needs to be done to restore performance;
- Extent of compliance with regulations and permits;
- Maintenance performed vs. planned – reasons for variances; performance and cost implications of variances;
- Breakdown incidents – what, when and why? What needs to be done to improve reliability;
- Actual costs vs. budget - reasons for variances; what needs to be done to resolve variances;
- Maintenance staffing and resources – are there sufficient, qualified staff; skill development and training needs; are sufficient, qualified contractors available; are sufficient equipment, parts and supplies readily available; what should be done to address resourcing issues;
- Necessary adjustments to planned maintenance – what, why, when, how and at what cost;
- Impacts on the capital plan - necessary repairs and replacements

Outputs:

- ❑ Relevant reports to FN leadership and stakeholders

Tips and Tricks:

- Take the necessary time to monitor and report on maintenance performance and to link it to overall infrastructure performance according to the CISP; engaging FN leadership by improving their overall understanding of the cause-effect relationships arising from their decisions can improve support for maintenance programs and funding

In Closing

This manual is intended to provide a step-by step process to develop a maintenance management plan for water and sewer infrastructure. Templates and a workbook accompany this manual to assist in the creation of the plan and are meant as a starting point to be edited to refined to suit the individual communities needs. To remain relevant once created, the maintenance management plan must be regularly reviewed and updated.

It is envisioned that the water and sewer MMP will form one of several maintenance management plans created to provide both preventative maintenance and required inputs for public works and administration planning.

APPENDIX A

Example Maintenance Management Plan

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TRIBAL COUNCIL

First Nation

Infrastructure Maintenance Management Plan

Water and Wastewater Assets

LOGO

Month Day, Year | DRAFT

Naut'sa mawt TRIBAL COUNCIL

Contents

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2. Water and Wastewater Asset Summary 2
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Appendices

Appendix A: Annual Maintenance Schedule

Appendix B: Annual Maintenance Budget

Appendix C: Work Orders

Appendix D: Reporting

1. Introduction

The following Maintenance Management Plan has been prepared for the Example First Nation in support of water and wastewater infrastructure assets on IR#1

The purpose of this document is to outline Maintenance plans, costs, and labour, equipment and material required to perform preventative and major maintenance tasks for IR#1 water and wastewater infrastructure.

In conjunction with this manual, operating manuals of the installed equipment must always be consulted prior to start-up and shut-down, as well as for routine operation, maintenance, inspection, and repair.

The operation and maintenance specifications contained in this document are provided for reference only and DO NOT provide a complete overview of safe operating conditions and requirements. It is the responsibility of each Operator to comply with all applicable regulations such as Workplace Hazardous Materials Information System (WHMIS) and Occupational Health and Safety Regulations.

The information contained in this manual is specific to the specified infrastructure on IR#1.

2. Water and Wastewater Asset Summary

Example First Nation water and wastewater infrastructure assets on IR#1 consist of the following:

SANITARY SYSTEM COMPONENT	QUANTITY
Gravity Sanitary Sewer	2.5 km
Sanitary Forcemain	0.7 km
Sanitary Lift Stations	3
Sewage Treatment Plant	1
Community Septic Tank and Field	1

WATER SYSTEM COMPONENT	QUANTITY
Watermains	3.8 km
Water Treatment Plant	1
Steel Reservoir	3

The locations of these components are indicated on the GIS Vertisee site, accessible via the following link: https://vertisee-a.mcelhanney.com/Apps/FirstNation/Asset_Inventory/

2.1. LIST OF QUALIFIED CONTRACTORS

SERVICE	COMPANY	CONTACT
CCTV Inspections	Bill's Inspections & Services Ltd.	250-555-5550
Watermain Leak Detection	Johnson's Water Utility Services	250-555-5581
Septic Pumping	Kathy's Septic Services	604-555-5575

3. Available As-Constructed Drawings and Component Maintenance Manuals

Table 1 - Available Drawings - Water and Wastewater

DRAWING SET NAME	ENGINEER/DESIGNER	DATE
Reserve No. 1 Roads and Services – 5517-003	First Engineering Ltd.	June 1988
Reserve No. 1 Municipal Services Upgrading	Engineering and Associates Ltd.	July 1985
Waterfront Road Watermain Realignment	First Engineering Ltd.	November 1995
Subdivision Key Plan	First Engineering Ltd.	July 1995
Community Centre Site Servicing Plan	Community Architects Ltd.	May 1997
Nation Water Reservoir Addition	First Engineering Ltd.	November 1998
Water Water Works Improvements	First Engineering Ltd.	October 1999
Sanitary System Improvements	First Engineering Ltd.	October 1999
Municipal Upgrading – Water System - Proposed	Engineering & Associates Ltd.	July 1983
Community Health Centre Record Drawings	Community Architects Ltd.	September 2005

Table 2 - Maintenance Manuals - Water and Wastewater

MAINTENANCE MANUAL TITLE	ENGINEER/DESIGNER	DATE
Sewage Collection and Disposal System Operation and Maintenance Manual	Johnson & Associates Ltd.	June 1989
Water Works Operation and Maintenance	First Engineering Ltd.	February 1997

Digital copies of the above noted documents are stored in First Nation File.

4. Health and Safety Policies

Table 3 - Health and Safety Policies

ASSET	HEALTH AND SAFETY POLICY	REFERENCE DOCUMENT
WATER	OHS Guidelines Part 4: General Conditions • Working Alone or In Isolation • Ergonomics (MSI) Requirements	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-04
WATER	OHS Guidelines Part 8: Personal Protective Clothing and Equipment	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-08
WATER	OHS Guidelines Part 18: Traffic Control	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-18
SANITARY	OHS Guidelines Part 4: General Conditions • Working Alone or In Isolation • Ergonomics (MSI) Requirements • Illumination	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-04
SANITARY	OHS Guidelines Part 8: Personal Protective Clothing and Equipment	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-08
SANITARY	OHS Guidelines Part 9: Confined Spaces	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-09
SANITARY	OHS Guidelines Part 18: Traffic Control	https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-18

5. Relevant Regulations, Policies, and Permits

Table 4 - Policies and Regulations

ASSET	POLICY / REGULATION	GOVERNING BODY	REFERENCE DOCUMENT
SANITARY	Wastewater Systems Effluent Regulations	Federal	https://www.gazette.gc.ca/rp-pr/p2/2012/2012-07-18/html/sor-dors139-eng.html
WATER	Nation Final Agreement Act Water	Provincial	https://www.bclaws.gov.bc.ca/civix/document/id/complete
WATER	Water Sustainability Act	Provincial	https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/14015
WATER	Guidelines for Canadian Drinking Water Quality	Federal	https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html

Table 5 - Permits

ASSET	PERMIT	GOVERNING BODY	REFERENCE DOCUMENT
WATER	Water Licences for Nation Watershed	Provincial	https://www.bclaws.gov.bc.ca/civix/document/id/complete

6. Preventative Maintenance Schedule

An Annual Maintenance Schedule is provided in **Appendix A**. The Annual Maintenance Schedule contains a list of all inspection and prevention maintenance tasks including:

- Activities with work orders numbered and grouped to indicate the work required for individual people or contractors;
- Person-hours for each activity shown weekly with a summary of total hours for the year

7. Preventative Maintenance Budget

An Annual Budget is provided in **Appendix B**. The budget shows the Operation and Maintenance costs including:

- An estimate of the annual cost of routine preventative maintenance;
- An estimate of the annual minor preventative repair costs;
- An estimate of operating costs including fuel.

8. Work Orders

Work Orders for the IR#1 Infrastructure are provided in **Appendix C**.

Each Work Order describes:

- Step by step, simple instructions of the routine and special maintenance duties;
- The safe number of persons required, and the equipment, tools and materials needed;
- The frequency or level of service;
- Estimated number of person-hours involved in each task;
- Contracted services if required.

8.1. WORK ORDER INDEX

The following table lists all suggested work orders applicable to the water and wastewater infrastructure.

Table 6 - Table of Work Orders

ASSET	WORK ORDER	DESCRIPTION	FREQUENCY
SANITARY	LS01	Lift Station Weekly Inspection	Weekly
SANITARY	LS02	Lift Station Monthly Inspection	Monthly
SANITARY	LS03	Lift Station Quarterly Inspection and Maintenance	Quarterly
SANITARY	LS04	Lift Station Semi-Annual Inspection and Maintenance	Semi-Annual
SANITARY	LS05	Lift Station Annual Inspection and Maintenance	Annual
SANITARY	LS06	Pump out and flush wet well - vac truck	Annual
SANITARY	S01	Annual Sanitary Main Inspection	Annual
SANITARY	S02	Main Flushing and Cleaning	Every 3 Years
SANITARY	S03	CCTV Inspection	Every 10 Years
SANITARY	S04	Vac Truck	As Required
SANITARY	S07	Annual Sanitary Air Release Valve Inspection and Maintenance	Annual
SANITARY	ST17	Monthly Influent Screen Inspection	Monthly
SANITARY	ST18	Monthly Spray Pump Inspection	Monthly
SANITARY	ST19	Quarterly Chemical Dosing Pump Maintenance	Quarterly
SANITARY	ST20	Semi-Annual Flocculator Tank Maintenance	Semi-Annual

SANITARY	ST21	Semi-Annual Filter Maintenance	Semi-Annual
SANITARY	ST22	Semi-Annual Chemical Dosing Pump Maintenance	Semi-Annual
SANITARY	ST03	Septic Tank Pumping	Every 5 years
SANITARY	ST04	Monthly Septic Tank Inspection	Monthly
SANITARY	ST05	Bi-Annual Septic Tank and Field Inspection and Maintenance	Bi-Annual
SANITARY	ST06	Sewage Treatment Plant Inspection	Daily
SANITARY	ST07	Weekly Effluent Pump Station Inspection and Maintenance	Weekly
SANITARY	ST08	Annual Effluent Pump Station Inspection and Maintenance	Annual
SANITARY	ST09	RBC Module Inspection	Monthly
SANITARY	ST10	Secondary Clarifiers Inspection and Maintenance	Daily
SANITARY	ST11	Chlorinators and Tank Inspection	Weekly
SANITARY	ST12	Annual Chlorinators and Tank Inspection and Maintenance	Annual
SANITARY	ST13	Dechlorinator Inspection and Maintenance	Weekly
SANITARY	ST14	Flow Recorder Inspection	Weekly
SANITARY	ST15	Outfall Inspection	Monthly
SANITARY	ST16	Flume Chamber	Bi-Weekly
WATER	W01	Distribution System Inspection	Monthly
WATER	W02	Annual Valve Inspection and Maintenance	Annual
WATER	W03	Watermain Flushing	Annual
WATER	W04	Hydrant Inspection, Maintenance, and Flushing	Annual
WATER	W07	Winterizing Water System	As Required
WATER	W08	Watermain Spot Repairs	As Required
WATER	W09	Curb Box and Curb Stop Repairs	As Required
WATER	W10	Fire Hydrant and Standpipe Test	3 Times per Year
WATER	W11	Valve Repair	As Required
WATER	W12	Hydrant Repair (General)	As Required
WATER	W13	Hydrant Repair (Internal)	As Required
WATER	W14	Hydrant Painting	As Required
WATER	W15	Air Release Valve Inspection and Maintenance	Bi-Annual
WATER	WS01	Weekly Inspection of Water Storage Facility	Weekly
WATER	WS02	Monthly Inspection and Maintenance of Storage Facility	Monthly
WATER	WS03	Quarterly inspection and Maintenance of Storage Facility	Quarterly

WATER	WS04	Annual Inspection and Maintenance of Water Storage Facility	Annual
WATER	WS05	Three to Five year inspection and Maintenance of Storage Facility	Every 3 Years
WATER	WT04	Water Treatment Plant Daily Inspection	Daily
WATER	WT05	Water Treatment Plant Week Day Inspections	Weekdays
WATER	WT06	Water Treatment Plant Periodic Inspections and Testing	Weekly
WATER	WT07	Water Treatment Plant Filter Scraping	6 times/year
WATER	WT08	Water Treatment Plant Media Addition	Every 6 years

8.1. RECOMMENDED MAINTENANCE EQUIPMENT

A list of recommended tools/equipment and materials/supplies to conduct maintenance work outlined in the suggested work orders is provided below.

SUGGESTED EQUIPMENT LIST		
❑ PPE (safety boots, glasses, gloves)	❑ Hydrant Wrench	❑ Compactor
❑ Maintenance Truck	❑ Hydrant Pump	❑ Tamper
❑ Traffic Cones	❑ Valve Key	❑ Mud Pump
❑ Safety Harness	❑ Valve Pick	❑ Misc. Hand Tools
❑ Spotlight	❑ Meter Box Key	❑ Compressor and blowpipe
❑ Mirrors	❑ 2.5" Valve	❑ Shovels
❑ Jet Cleaning Ball	❑ Power Rodder	❑ Wheelbarrow
❑ Poly Rope	❑ Inspection Log	❑ Grease Gun
❑ Manhole Jack	❑ Control Panel Keys	❑ Squeegee
❑ Manhole Lifter	❑ Wrench Set	❑ Chlorine Test Kit
❑ Hand Pump	❑ Multimeter	❑ Bobcat
❑ Fire Hose	❑ Backhoe	

SUGGESTED MATERIALS AND SUPPLIES LIST		
❑ Epoxy Paint (yellow, red)	❑ Oil	❑ Repair clamps
❑ Paint brushes, rags	❑ Lubricant	❑ Spare parts (valves, o-rings, etc.)
❑ Number stencils	❑ Sand	❑ Chlorine tablets
❑ Cement/Grout	❑ Gravel	❑ Sodium thiosulphate
❑ Fuel	❑ Flow recording Strip	❑ Pipe/repair sleeves/couplings, etc.
❑ Coolant		

A list of task specific materials, supplies, and equipment can be found on individual work orders.

9. Reporting

Templates for Reporting are found in **Appendix D**. The reporting templates include layout for input such as:

- Routine inspection and special maintenance duties;
- Operation and Maintenance and monitoring data log;
- Operator's name, training and certification information;
- Proposed O&M cost estimate for each task related to routine inspection/maintenance including:
    - Wages,
    - Service contractors,
    - Utility bills,
    - Repair/Replacement Costs.

APPENDIX A - *Example MMP*

Annual Maintenance Schedule

NATION
LOGO

Instructions:
1. Paste required work order Task Code(s) in the "Task Code" column.
2. Distribute "Crew Hours Per Year" through the Annual Calendar. Use the "CHECK" column on the far right to ensure the appropriate number of hours have been distributed.
3. Use the "As Required" column to input hours with a frequency greater than one year (ie. every 3 years). "As Required" hours will autopopulate in this column.

Notes and Assumptions:
- This Schedule calculates the total number of hours based on quantity of each system component inventoried, as noted in the ***"Community Infrastructure Summary"*** *on the Table of Contents.*
- Operator weekly totals will not exceed ***"Main Operator Weekly Hours"*** *as entered on the Table of Contents.*

ASSET GROUP
SANITARY
WATER

Return to Table of Contents

SCHEDULE SUMMARY	
ANNUAL HOURS	
OPERATOR 1	**1291**
OPERATOR 2	**620**
OPERATOR 3	**71**
TRUCK HOURS	**1186**
MAINTENANCE PLANING HOURS:	**201**

Maintenance Planning Hours budgeted at 10% of maintenance hours

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TRIBAL COUNCIL

Weekly Totals

TOTAL HOURS	30	23.5	45	55.7	25.5	29	55.7	52.7	26.5	29	39	55.7	48	37	32	47	40.5	29.5	39	55.7	28.5	50	55.7	52.7	30	25.5	55.7	45	25.5	25.5	29	55.7	23	23	25.5	30	39	55.7	39	23.5	55.7	29	52.7	25.5	29	39	55.7	28.5	29	55.7	23	25	ANNUAL HOURS
Operator 1	25	23.5	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	23	23	25	25	25	25	25	23.5	25	25	25	25	25	25	25	25	25	25	23	25	1291
Operator 2	5	0	20	25	0.5	4	25	25	1.5	4	14	25	23	12	7	22	15.5	4.5	14	25	3.5	25	25	25	5	0.5	25	20	0.5	0.5	4	25	0	0	0.5	5	14	25	14	0	25	4	25	0.5	4	14	25	3.5	4	25	0	0	619.5
Operator 3	0	0	0	5.7	0	0	5.7	2.7	0	0	0	5.7	0	0	0	0	0	0	0	5.7	0	0	5.7	2.7	0	0	5.7	0	0	0	0	5.7	0	0	0	0	0	5.7	0	0	5.7	0	2.7	0	0	0	5.7	0	0	5.7	0	0	70.8

WATER AND WASTEWATER INFRASTRUCTURE ASSETS
ANNUAL MAINTENANCE SCHEDULE

ANNUAL CALENDAR

				Crew Hours per Year		January				February				March				April				May				June				July					August					September				October					November				December					As Required
Task Code	ASSET GROUP	Task Description	Frequency	Operator	Truck	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	N/A
W01	WATER	Distribution System Inspection	Monthly	360	360				33			33					33								33			33				33					33						33			33						33			33			
W02	WATER	Annual Valve Inspection and Maintenance	With W01	0	0																																																					0.0
W03	WATER	Watermain Flushing	Annual	39	39																24	15																																				
W04	WATER	Hydrant Inspection, Maintenance, and Flushing	Annual	14	14														14																																							
W07	WATER	Winterizing Water System	As required	0	0																																																					8.0
W08	WATER	Watermain Spot Repairs	As Required	0	0																																																					4.0
W09	WATER	Curb Box and Curb Stop Repairs	As Required	0	0																																																					4.0
W10	WATER	Fire Hydrant and Standpipe Test	3 Times per Year	89	89								30																30																			30										
W11	WATER	Valve Repair	As Required	0	0																																																					4.0
W12	WATER	Hydrant Repair (General)	As Required	0	0																																																					4.0
W14	WATER	Hydrant Painting	As Required	0	0																																																					2.0
WS01	WATER	Weekly Inspection of Water Storage Facility	Weekly	120	120	3	3		3	3		3	3	3		3	3	3	3		3	3		3	3	3		3	3	3	3	3		3	3		3	3	3	3		3	3	3	3	3		3	3		3	3	3		3	3	3	
WS02	WATER	Monthly Inspection and Maintenance of Storage Facility	Monthly	72	24						9				9								9				9									9					9									9				9				
WS03	WATER	Quarterly inspection and Maintenance of Storage Facility	Quarterly	27	9			9																									9														9											
WS04	WATER	Annual Inspection and Maintenance of Water Storage Facility	Annual	12	3															12																																						
WS05	WATER	Three to Five year inspection and Maintenance of Storage Facility	Every 3 Years	8	1																																																					8.0
WT04	WATER	Water Treatment Plant Daily Inspection	Daily	365	0	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8	
WT06	WATER	Water Treatment Plant Periodic Inspections and Testing	Weekly	104	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
WT07	WATER	Water Treatment Plant Filter Scraping	6 times/year	96	12			16								16								16									16									16									16							
WT08	WATER	Water Treatment Plant Media Addition	Every 6 years	10	3																																																					
LS01	SANITARY	Lift Station Weekly Inspection	Weekly	120	120		3	3	3		3	3	3		3	3	3		3	3	3		3	3	3		3	3	3		3	3	3	3		3	3	3	3		3	3	3		3	3	3	3		3	3	3		3	3	3	3	
LS02	SANITARY	Lift Station Monthly Inspection	Monthly	36	24					4.5				4.5								4.5				4.5									4.5					4.5									4.5				4.5					
LS03	SANITARY	Lift Station Quarterly Inspection and Maintenance	Quarterly	18	6	9																								9																												
LS04	SANITARY	Lift Station Semi-Annual Inspection and Maintenance	Semi-Annual	18	3																																							18														
LS05	SANITARY	Lift Station Annual Inspection and Maintenance	Annual	24	3													24																																								
LS06	SANITARY	Pump out and flush wet well - vac truck	Annual	3	3													3																																								
S01	SANITARY	Annual Sanitary Main Inspection	Annual	21	21																						21																															
S02	SANITARY	Main Flushing and Cleaning	Every 3 Years	10	10																																																					10.0
S03	SANITARY	CCTV Inspection	Every 10 Years	1	1																																																					1.0
S04	SANITARY	Vac Truck	As Required	0	0																																																					0.0
S05	SANITARY	Annual Forcemain Inspection	Annual	2	2																													2																								
ST03	SANITARY	Septic Tank Pumping	Every 5 years	0	0																																																					1.0
ST04	SANITARY	Quarterly Septic Tank Inspection	Quarterly	2	1									1.0																											1																	
ST05	SANITARY	Bi-Annual Septic Tank and Field Inspection and Maintenance	Bi-Annual	6	1																					3																											3					
ST06	SANITARY	Sewage Treatment Plant Inspection	Daily	91	91	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	
ST07	SANITARY	Weekly Effluent Pump Station Inspection and Maintenance	Weekly	26	13	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
ST08	SANITARY	Annual Effluent Pump Station Inspection and Maintenance	Annual	1	0																										1																											
ST09	SANITARY	RBC Module Inspection	Monthly	12	3	1				1				1				1				1				1				1					1					1				1					1				1					
ST10	SANITARY	Secondary Clarifiers Inspection and Maintenance	Daily	183	91	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	4.5	
ST11	SANITARY	Chlorinators and Tank Inspection	Weekly	13	13	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
ST12	SANITARY	Annual Chlorinators and Tank Inspection and Maintenance	Annual	2	0																										2																											
ST13	SANITARY	Dechlorinator Inspection and Maintenance	Weekly	13	13	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
ST14	SANITARY	Flow Recorder Inspection	Daily	91	91	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	1.8	1.75	
ST15	SANITARY	Outfall Inspection	Quarterly	2	1		0.5																0.5											0.5											0.5													

APPENDIX B - *Example MMP*

Annual Maintenance Budget

NATION LOGO

Instructions:
Enter desired work order(s) in the "Task Code" column. All remaining columns will populate with information from the "ii. WO Data Masterlist" tab.

Notes and Assumptions:
*This Budget calculates the total annual cost based on quantity of each system component inventoried, as noted in the **"Community Infrastructure Summary"** on the Table of Contents.*

Return to Table of Contents

Asset Group
SANITARY
WATER

Asset Component
Community Septic Tank
Forcemain
Lift Station
Main
Reservoir
Sewage Treatment Plant

Labour Rates	
Labour	$ 31.00
Truck	$ 16.47

TOTAL ANNUAL BUDGET	
Operator	$ *62,311.32*
Truck	$ *19,521.60*
Contractor	$ *11,199.99*
Equipment	$ *5,568.33*
Parts & Materials	$ *21,066.67*
Energy Requirements	$ *37,000.00*
TOTAL WATER AND WASTEWATER O&M	**$ 156,667.92**

WATER AND WASTEWATER INFRASTRUCTURE ASSETS
ANNUAL MAINTENANCE BUDGET

Naut'sa mawt TRIBAL COUNCIL

Maintenance Task					Crew Hours per Year		Costs per Task				
Task Code	Asset Group	Asset Component	Task Description	Frequency	Operator	Truck	Contractor	Equipment	Parts & Materials	Annual Energy Cost	Annual Budget
W01	WATER	Main	Distribution System Inspection	Monthly	360	360	$ -	$ 100.00	$ 175.00	$ -	$ 20,106.81
W02	WATER	Main	Annual Valve Inspection and Maintenance	With W01	0	0	$ -	$ -	$ -	$ -	$ -
W03	WATER	Main	Watermain Flushing	Annual	39	39	$ -	$ 100.00	$ 50.00	$ -	$ 2,002.72
W04	WATER	Main	Hydrant Inspection, Maintenance, and Flushing	Annual	14	14	$ -	$ 100.00	$ 50.00	$ -	$ 811.25
W07	WATER	Main	Winterizing Water System	As required	0	0	$ -	$ -	$ -	$ -	$ -
W08	WATER	Main	Watermain Spot Repairs	As Required	0	0	$ -	$ -	$ 50.00	$ -	$ -
W09	WATER	Main	Curb Box and Curb Stop Repairs	As Required	0	0	$ -	$ -	$ 25.00	$ -	$ -
W10	WATER	Main	Fire Hydrant and Standpipe Test	3 Times per Yea	89	89	$ -	$ -	$ -	$ -	$ 4,204.23
W11	WATER	Main	Valve Repair	As Required	0	0	$ -	$ -	$ 25.00	$ -	$ -
W12	WATER	Main	Hydrant Repair (General)	As Required	0	0	$ -	$ -	$ 25.00	$ -	$ -
W14	WATER	Main	Hydrant Painting	As Required	0	0	$ -	$ 10.00	$ 25.00	$ -	$ -
WS01	WATER	Reservoir	Weekly Inspection of Water Storage Facility	Weekly	120	120	$ -	$ -	$ -	$ -	$ 5,695.99
WS02	WATER	Reservoir	Monthly Inspection and Maintenance of Storage Facility	Monthly	72	24	$ -	$ 10.00	$ 50.00	$ -	$ 4,067.20
WS03	WATER	Reservoir	Quarterly inspection and Maintenance of Storage Facility	Quarterly	27	9	$ -	$ 10.00	$ 50.00	$ -	$ 1,525.20
WS04	WATER	Reservoir	Annual Inspection and Maintenance of Water Storage Facility	Annual	12	3	$ -	$ 10.00	$ 100.00	$ -	$ 751.40
WS05	WATER	Reservoir	Three to Five year inspection and Maintenance of Storage Facility	Every 3 Years	8	1	$ -	$ 50.00	$ 200.00	$ -	$ 514.47
WT04	WATER	Water Treatment Plant	Water Treatment Plant Daily Inspection	Daily	365	0	$ -	$ -	$ -	$ 29,000.00	$ 40,315.00
WT06	WATER	Water Treatment Plant	Water Treatment Plant Periodic Inspections and Testing	Weekly	104	0	$ -	$ -	$ 10.00	$ -	$ 3,744.00
WT07	WATER	Water Treatment Plant	Water Treatment Plant Filter Scraping	6 times/year	96	12	$ -	$ 200.00	$ 100.00	$ -	$ 4,973.60
WT08	WATER	Water Treatment Plant	Water Treatment Plant Media Addition	Every 6 years	10	3	$ -	$ 200.00	$ 1,000.00	$ -	$ 564.89
LS01	SANITARY	Lift Station	Lift Station Weekly Inspection	Weekly	120	120	$ -	$ -	$ 50.00	$ -	$ 11,695.99
LS02	SANITARY	Lift Station	Lift Station Monthly Inspection	Monthly	36	24	$ -	$ -	$ 50.00	$ -	$ 2,711.20
LS03	SANITARY	Lift Station	Lift Station Quarterly Inspection and Maintenance	Quarterly	18	6	$ -	$ 50.00	$ 150.00	$ -	$ 1,856.80
LS04	SANITARY	Lift Station	Lift Station Semi-Annual Inspection and Maintenance	Semi-Annual	18	3	$ -	$ 50.00	$ 100.00	$ -	$ 1,057.40
LS05	SANITARY	Lift Station	Lift Station Annual Inspection and Maintenance	Annual	24	3	$ -	$ 600.00	$ 900.00	$ 3,900.00	$ 9,193.40
LS06	SANITARY	Lift Station	Pump out and flush wet well - vac truck	Annual	3	3	$ 2,500.00	$ -	$ -	$ -	$ 7,642.40
S01	SANITARY	Main	Annual Sanitary Main Inspection	Annual	21	21	$ -	$ 50.00	$ 200.00	$ -	$ 1,261.86
S02	SANITARY	Main	Main Flushing and Cleaning	Every 3 Years	10	10	$ -	$ 75.00	$ -	$ -	$ 491.24
S03	SANITARY	Main	CCTV Inspection	Every 10 Years	1	1	$ 20,999.94	$ -	$ -	$ -	$ 2,128.87
S04	SANITARY	Main	Vac Truck	As Required	0	0	$ 1,500.00	$ -	$ -	$ -	$ 1,500.00
S05	SANITARY	Forcemain	Annual Forcemain Inspection	Annual	2	2	$ -	$ 100.00	$ 50.00	$ -	$ 230.17
ST03	SANITARY	Community Septic Tank	Septic Tank Pumping	Every 5 years	0	0	$ 500.00	$ -	$ -	$ -	$ 107.85
ST04	SANITARY	Community Septic Tank	Quarterly Septic Tank Inspection	Quarterly	2	1	$ -	$ 50.00	$ 50.00	$ -	$ 278.47
ST05	SANITARY	Community Septic Tank	Bi-Annual Septic Tank and Field Inspection and Maintenance	Bi-Annual	6	1	$ -	$ 50.00	$ 300.00	$ -	$ 902.47
ST06	SANITARY	Sewage Treatment Plant	Sewage Treatment Plant Inspection	Daily	91	91	$ -	$ -	$ -	$ -	$ 4,331.33
ST07	SANITARY	Sewage Treatment Plant	Weekly Effluent Pump Station Inspection and Maintenance	Weekly	26	13	$ -	$ -	$ -	$ -	$ 1,020.07
ST08	SANITARY	Sewage Treatment Plant	Annual Effluent Pump Station Inspection and Maintenance	Annual	1	0	$ -	$ -	$ -	$ 2,300.00	$ 2,335.12
ST09	SANITARY	Sewage Treatment Plant	RBC Module Inspection	Monthly	12	3	$ -	$ -	$ 10.00	$ -	$ 541.40
ST10	SANITARY	Sewage Treatment Plant	Secondary Clarifiers Inspection and Maintenance	Daily	183	91	$ -	$ -	$ -	$ -	$ 7,160.08
ST11	SANITARY	Sewage Treatment Plant	Chlorinators and Tank Inspection	Weekly	13	13	$ -	$ -	$ 10.00	$ -	$ 1,137.07
ST12	SANITARY	Sewage Treatment Plant	Annual Chlorinators and Tank Inspection and Maintenance	Annual	2	0	$ -	$ -	$ 50.00	$ 1,800.00	$ 1,916.12
ST13	SANITARY	Sewage Treatment Plant	Dechlorinator Inspection and Maintenance	Weekly	13	13	$ -	$ -	$ 20.00	$ -	$ 1,657.07
ST14	SANITARY	Sewage Treatment Plant	Flow Recorder Inspection	Daily	91	91	$ -	$ -	$ 5.00	$ -	$ 6,156.33
ST15	SANITARY	Sewage Treatment Plant	Outfall Inspection	Quarterly	2	1	$ -	$ -	$ -	$ -	$ 78.47

APPENDIX C - *Example MMP*

Work Orders

WORK ORDER **S01**

ASSET	Sanitary Mains throughout community	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity Main		
TASK DESCRIPTION	Annual Sanitary Main Inspection	**RECEIVED BY:**	
FREQUENCY	Annual (est. 7.9 labor hours/km of sanitary main)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Sanitary Mains throughout community		
WORK LOCATION	Throughout Community		

WORK DESCRIPTION	Annual inspection of sanitary main, manhole and sewer flow
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Traffic Cones, Safety Harness, Spotlight, Mirrors, Power Rodder
MATERIALS REQUIRED	Yellow Epoxy Paint, Cement/Grout

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	21.0	$ 31.00	$ 651.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 200.00	$ 200.00
		LABOR TOTAL	**$ 901.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:

- ❑ Working Alone or in Isolation
- ❑ Ergonomics (MSI) Requirements
- ❑ Illumination
- ❑ Personal Protective Clothing and Equipment
- ❑ Confined Spaces
- ❑ Traffic Control

WORK ORDER **S01**

WORK DESCRIPTION
❑ Review all equipment before leaving workshop ❑ Barricade off all work area when in traffic areas. ❑ Note conditions of manhole structure especially infiltration at joints and around frame, repair with waterproofing cement grout. ❑ Prepare list of observed maintenance and repair work required. ❑ Inspect interior of sewer pipe. If there is evidence of siltation or the accumulation of solids, use rodding equipment to remove or engage qualified contractor. Additionally note any areas which are in need of possible repairs.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S02**

ASSET	Sanitary Mains throughout community	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity Main		
TASK DESCRIPTION	Main Flushing and Cleaning	**RECEIVED BY:**	
FREQUENCY	Every 3 Years (est. 11.4 labor hours/km of sanitary main)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Sanitary Mains throughout community		
WORK LOCATION	Throughout Community		

WORK DESCRIPTION	Flushing of sanitary main every 5 years
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Jet Cleaning Ball, Poly Rope, Manhole Jack, Hand Pump, Fire Hose, Hydrant Wrench, Manhole lifter, 2.5" Valve
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	30.0	$ 31.00	$ 930.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 75.00	$ 75.00
Parts + Materials			$ -
		LABOR TOTAL	**$ 1,005.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment
❑ Traffic Control

WORK ORDER **S02**

WORK DESCRIPTION

- ❑ This task is to be coordinated with watermain hydrant flushing task.
- ❑ Start at the head of each sewer run and proceed to work downstream.
- ❑ Open manhole cover and downstream manhole cover and ventilate as required.
- ❑ Connect hose to fire hydrant valve and backflow preventer. Hold the nozzel firmly at the top of the manhole. Never place the fire hose directly into the manhole.
- ❑ Have the same person operate all the hydrants as the cleaning progresses. It is very important to have a separate person with clean clothing handling the hydrants to avoid contamination of the water system.
- ❑ Starting from the upstream sanitary manhole, flush each sanitary main until water runs clear in downstream manhole.
- ❑ Pack up equipment, turn off hydrants, and proceed to the next manhole to flush the next pipe section. Repeat until all sewers and manholes have been cleaned.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S03**

ASSET	Sanitary Mains throughout community	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity and Force Mains		
TASK DESCRIPTION	CCTV Inspection	**RECEIVED BY:**	
FREQUENCY	Every 10 Years (est. 2.2 labor hours/km of sanitary main)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Sanitary Mains throughout community		
WORK LOCATION	Throughout Community		

WORK DESCRIPTION	CCTV Inspection of Sanitary Distribution and Collection Mains
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Traffic Cones
MATERIALS REQUIRED	N/A

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0	$ 31.00	$ 31.00
Maintenance Assistant			$ -
Truck			$ -
Contractor		$ 20,999.94	$ 20,999.94
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 21,030.94**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment
❑ Traffic Control

WORK ORDER **S03**

WORK DESCRIPTION
❑ Retain certified CCTV inspection company to perform inspection of system. ❑ Supervise inspection, update maintenance log noting any required repairs.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S04**

ASSET	Sanitary Mains throughout community	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity and Force Mains		
TASK DESCRIPTION	Vac Truck	**RECEIVED BY:**	
FREQUENCY	As Required		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Sanitary Mains throughout community		
WORK LOCATION	Throughout Community at sanitary manholes		

WORK DESCRIPTION	Vac Truck
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Traffic Cones
MATERIALS REQUIRED	N/A

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.0		$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor		$ 1,500.00	$ 1,500.00
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 1,500.00**

REFERENCE DOCUMENTS

❑ N/A

WORK ORDER **S04**

WORK DESCRIPTION
❑ Retain certified Vac Truck company for service as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS01**

ASSET	Lift Stations	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Weekly Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 1 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Three lifts stations - Front St, 1st Ave, Waterfront St.		
WORK LOCATION	Front St, 1st Ave, Waterfront St.		

WORK DESCRIPTION	Visual and auditory inspection of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	Generator Fuel

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0	$ 31.00	$ 31.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 81.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **LS01**

WORK DESCRIPTION
❑ Visually/audibly inspect the lift station. Check for signs of damage/vandalism. ❑ Record pump hours for each pump. Check for uneven pump run times. ❑ Wash down the wet well. ❑ Check for sand and sludge accumulation. ❑ Check for indication of high water levels. ❑ Inspect lights and alarm systems. ❑ Ensure adequate fuel levels in the generator and ensure no fluid leaks. ❑ Complete inspection form

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS02**

ASSET	Lift Stations	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Monthly Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 1.5 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Three lifts stations - Front St, 1st Ave, Waterfront St.		
WORK LOCATION	Front St, 1st Ave, Waterfront St.		

WORK DESCRIPTION	Visual and auditory inspection of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.5	$ 31.00	$ 46.50
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 96.50**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ Additional Work Orders: **GEN01**

WORK ORDER **LS02**

WORK DESCRIPTION
❑ Visually inspect each pump for proper pumping (run each pump by manual control, watch level rise and fall.) ❑ Pump down wet well to lowest point, and make visual inspection. ❑ Check wet well floats. ❑ Exercise suction and discharge valves. ❑ Test back-up generator - check engine coolant and oil level and battery charger. **SEE WORK ORDER GEN01** ❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS03**

ASSET	Lift Stations	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Quarterly Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Quarterly (Every Three Months) - est. 3 labor hrs		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Three lifts stations - Front St, 1st Ave, Waterfront St.		
WORK LOCATION	Front St, 1st Ave, Waterfront St.		

WORK DESCRIPTION	Visual and auditory inspection of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	3.0	$ 31.00	$ 93.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 150.00	$ 150.00
		LABOR TOTAL	**$ 293.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **LS03**

WORK DESCRIPTION
❑ Remove excessive grit & grease with VAC truck (if required). ❑ Test generators, under load, for 15 minutes. ❑ Inspect pumps (visually check pumps and piping for defects, record amperage readings for each pump). ❑ Clean and inspect floats. ❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS04**

ASSET	Lift Station	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Semi-Annual Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Semi Annual (est. 6 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Three lifts stations - Front St, 1st Ave, Waterfront St.		
WORK LOCATION	Front St, 1st Ave, Waterfront St.		

WORK DESCRIPTION	Thorough inspection and cleaning of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	6.0	$ 31.00	$ 186.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 100.00	$ 100.00
		LABOR TOTAL	**$ 336.00**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ Additional Work Orders: **GEN02**

WORK ORDER **LS04**

WORK DESCRIPTION
❑ *Work to be completed by O&M staff or by a certified Lift Station Servicing Contractor* ❑ Record pump hours. ❑ Conduct Generator Maintenance GEN02 ❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS05**

ASSET	Lift Station	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Annual Inspection and Maintenance		
FREQUENCY	Annual (est. 8 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Three lifts stations - Front St, 1st Ave, Waterfront St.		
WORK LOCATION	Front St, 1st Ave, Waterfront St.		

WORK DESCRIPTION	Thorough inspection and cleaning of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	8.0	$ 31.00	$ 248.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 600.00	$ 600.00
Parts + Materials		$ 900.00	$ 900.00
		LABOR TOTAL	**$ 1,748.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **LS05**

WORK DESCRIPTION

❑ *Work to be completed by O&M staff or by a certified Lift Station Servicing Contractor*
❑ Record pump hours.
❑ Open panel, megger all pumps.
❑ Run all pumps and check their current.
❑ Visually inspect control panel.
❑ Visually inspect pump tank, tank hatches, guide rails and guid rail holders.
❑ Check functionality of check valves.
❑ Visually inspect flush valve, check flush valve oil if necessary, change oil or totally rebuilding flush valve on site if needed.
❑ Re-arrange pump cable and chain if needed for easy removal of pumps.
❑ Pull pumps and ressure wash while still in tank to minimize surface contamination.
❑ Visually inspect pumps, lifting handle, chain, cable, colute face, and the stator and oil chamber plugs for wear.
❑ Replace lifting handle, chain, stator and oil chamber plugs on site if needed.
❑ Check the stator and oil chamber for oil level and water infiltration.
❑ Inspect impeller.
❑ Test run pumps out of tank to listen for noisy bearings, vibrations or abnormal operation and rotation.
❑ Inspect existing zincs or install new ones depending on pump condition.
❑ Lower pumps back into tank.
❑ Test run pumps and check their current. Ensure pumps are pumping down the effluent in the station. Ensure pumps are seated properly.
❑ Inspect float switches, clean off if necessary.
❑ Make sure float switch levels are correct.
❑ Run through float switch cycle if needed.
❑ Replace float switch on site if needed.
❑ Ensure all breakers are on and pump switches are set to auto before leaving.
❑ Ensure all alarms are reset.
❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS06**

ASSET	Lift Station	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Pump out and Flush Wet Well - Vac Truck	**RECEIVED BY:**	
FREQUENCY	Annual (est. 1 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Three lifts stations - Front St, 1st Ave, Waterfront St.		
WORK LOCATION	Front St, 1st Ave, Waterfront St.		

WORK DESCRIPTION	Pump out and Flush Wet Well - Vac Truck
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses, gloves
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor		$ 2,500.00	$ 2,500.00
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 2,500.00**

REFERENCE DOCUMENTS

❑ N/A

WORK ORDER **LS06**

WORK DESCRIPTION
❑ Make arrangements to have a qualified vac truck contractor pump out and flush wet well.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W01**

ASSET	Community Water Mains	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Monthly Distribution System Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 6.3 hr/km of watermain)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Water Mains throughout community		
WORK LOCATION	Throughout community		

WORK DESCRIPTION	Monthly inspection of distribution system
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Valve wrench set, Valve pick
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	24.0	$ 31.00	$ 744.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 844.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W01**

WORK DESCRIPTION

- ❑ Walk or drive along all watermain rights-of-way and check for signs of dampness, or accumulation of water or ice, which may indicate leakage.
- ❑ Check that all hydrants and standpipes are straight up and down. Clear any vegetation around them to make them easily visible/accessible.
- ❑ Check that all valve box lids, hydrant caps, and other appurtenances are in place. Set back in place if missing, repair damage.
- ❑ Locate and expose all valve boxes. Open alll valve box lids to ensure they are accessible. Check all main valves and ensure valve stem is vertical. Movement of valves could indicate failure due to fracture or misalignment.
- ❑ Close and open main valves and check for leaks. After operating each valve ensure that it is left in its normal operating position.
- ❑ Record locations of any new main valves and services on as-built drawings and O&M manual
- ❑ Survey the residents to check for leaks, lack of pressure, dirty water, and water taste (chlorine)
- ❑ Note any signs of excessive water usage.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W02**

ASSET	Water valves	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Valve Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 5 labour hrs/km of watermain)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Water valves throughout community		
WORK LOCATION	Throughout community		

WORK DESCRIPTION	Locate, inspect, and perform maintenance on valves
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, valve key
MATERIALS REQUIRED	Lubricants and epoxy paint as required

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	19.0	$ 31.00	$ 589.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 150.00	$ 150.00
		LABOR TOTAL	**$ 789.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W02**

WORK DESCRIPTION

- ❑ Notify Band Office, Campground Office, and Fire Department that water supply will be interrupted. Review all equipment before leaving the yard.
- ❑ Remove valve box top and clean out debris etc. from box, if applicable. Remove sand, etc. from valve and lubricate gears, bolts, etc.
- ❑ Work valve (opening an closing) slowly until confident that valve is closed when shut. All valves close by turning valve stem clockwise. Check for leaks. Check if valve is vertical, movement of valves could indicate possible failure due to fracture or misalignment.
- ❑ Proceed to next valve and repeat above steps to isolate the section of watermain.
- ❑ Check with consumers connected to isolated section to determine if valve is functioning properly (i.e. water is shut off). If water is still available, repeat Steps 3 to 6 until valve is functioning properly. If still unable to operate valve correctly after 3 attempts, contact Engineer and band office.
- ❑ Before leaving a valve fully open, turn clockwise one half turn to prevent the valve from sticking.
- ❑ Proceed to next section (Paint valve boxes with epoxy yellow and mark with stake if required)

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W03**

ASSET	Community water mains	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Watermain Flushing	**RECEIVED BY:**	
FREQUENCY	Annual (est. 8 labor hr/km of watermain)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Water Mains throughout community		
WORK LOCATION	Throughout community		

WORK DESCRIPTION	Annual Watermain Flushing
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Hydrant wrench / hydrant pump, fire hose
MATERIALS REQUIRED	Lubricants and epoxy paint as required

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	30.0	$ 31.00	$ 930.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 100.00	$ 100.00
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 1,080.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W03**

WORK DESCRIPTION

- ❑ Mains are flushed by opening hydrants creating high flows in mains to flush out silt, rust, etc.
- ❑ Notify all affected water users that system is being flushed.
- ❑ Ensure reservoir is full.
- ❑ Start at hydrant closest to where supply main joins distribution system. Attach fire hose and run hose to ditch or sewer manhole to control water. (If hose run into sewer, coordinate with sewer flushing task S02.)
- ❑ Open hydrant fully and flush for 10 minutes or until water runs clear.
- ❑ Slowly close hydrant, grease threads lightly, and replace port caps.
- ❑ Pick up hoses, move to next hydrant downstream, and repeat until all mains are flushed.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W04**

ASSET	Community Fire Hydrants	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Hydrant Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 3.7 labor hrs/km of watermain)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Hydrants throughout community		
WORK LOCATION	Hydrants throughout community		

WORK DESCRIPTION	Annual inspection and maintenance of fire hydrants
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Hydrant wrench / hydrant pump, valve key
MATERIALS REQUIRED	Lubricants and epoxy paint as required

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	14.0	$ 31.00	$ 434.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 100.00	$ 100.00
Parts + Materials		$ 150.00	$ 150.00
		LABOR TOTAL	**$ 684.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W04**

WORK DESCRIPTION

- ❑ Notify Band Office, Campground Office, and Fire Department that water supply will be interrupted.
- ❑ With outlet nozzel cap closed, open the hydrant fully until the stem stops turning.
- ❑ If stem action is tight, open and close it a few times until operation is smooth and free.
- ❑ If there is leakage at the joints, packing seals, or nozzels, close hydrant and lubricate, tighten or replace packing, nozzles gaskets, and O rings. (Use jet-lube on operating nut and AP-5 on nozzles. These are lubricants non-destructive to rubber lined fire hose).
- ❑ With the hydrant closed, remove a nozzle cap.
- ❑ Look and listen for water that continues to flow indicating leakage through the main valve, if there is a leak, make a note and arrange for repairs.
- ❑ Open the hydrant and flush out debris for 1 minute. (If a hose is used to redirect the water, then after flushing, close the hydrant, removed hose and re-open hydrant until water flows from nozzle).
- ❑ Remove independent cut-off nozzle cap, where present, fully open and close valve to ensure ease of operation. Lubricate if required and check that there is an unrestricted flow of water through the nozzle.
- ❑ Close the hydrant and check for drainage by putting hand over nozzle and feeling for suction, replace cap only when suction stops. If there is no suction or if water is observed in the barrel, open the hydrant until water discharges from the nozzle. This action should flush the hydrant drain. Shut the hydrant and recheck for suction. Hydrants with blocked or permanently plugged drains should be marked and pumped out after each usage.
- ❑ Clean and lubricate nozzle threads.
- ❑ If any leakages cannot be corrected with tools at hand or if hydrant is inoperable, close auxiliary valve. Inform Fire Department and promptly arrange to have repairs carried out.
- ❑ Check that hydrant is reassembled properly and functional. Paint the hydrants if required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W08**

ASSET	Community Water Mains	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Watermain		
TASK DESCRIPTION	Watermain Spot Repairs	**RECEIVED BY:**	
FREQUENCY	As needed (est. 8 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Water Mains throughout community		
WORK LOCATION	Throughout community		

WORK DESCRIPTION	Watermain Spot Repairs
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, backhoe, compactor, mud pump, hand tools
MATERIALS REQUIRED	Sand bedding, gravel, repair sleeves, couplings, pipe

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	8.0	$ 31.00	$ 248.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 298.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment
❑ Traffic Control

WORK ORDER **W08**

WORK DESCRIPTION

- ❑ Ensure that the equipment is operative before leaving yard.
- ❑ Obtain BC 1 Call ticket to confirm locations of underground services (oil, propane, power, sewer, watermains and services). Check available plans.
- ❑ Proceed to designated area and set out required safety devices and signs.
- ❑ If there is no flooding of homes, etc., leave main line on and:
- ❑ a. have consumers notified
- ❑ - to store any required water during the interruption
- ❑ - probable duration of water service interruption
- ❑ b. then locate the break in main line pipe by any means necessary (leak detector, drilling holes in pavement, checking for noise on meters and/or curb boxes)
- ❑ c. shut off valves required to isolate main
- ❑ If there is flooding of homes etc., the main line must be shut off immediately. Then proceed through previous steps to notify consumers and isolate break in the main.
- ❑ Notify Band Office and fire department of number and location of hydrants involved.
- ❑ Notify Band Office and fire department of required traffic rerouting (streets closing and detours).
- ❑ Excavate.
- ❑ Repair pipe at damaged spot using required repair clamps.
- ❑ Check elevations for local depressions and repair pipe bedding where necessary.
- ❑ Open main line valves. Check new section of pipe and joints for leakage.
- ❑ If leakage is observed, shut off valves to isolate main line and carry out corrective action. Repeat previous step to ensure leakage is resolved.
- ❑ Slowly open hydrants only to remove air, rust, and sand from watermain.
- ❑ Backfill around the pipe and 300mm over the pipe with clean granular material less than 25mm in size. Compact by hand in 150mm lifts to give firm support for the pipe. Ensure that no large rocks come in contact with pipe or repair clamps.
- ❑ Backfill excavation above the pipe zone with native soil in 200mm layers. Compact each layer with compactor.
- ❑ Notify Band Office and fire department that the watermain and hydrants are back in service.
- ❑ Repair travelled surface as needed, remove equipment and clean up area.
- ❑ Have health unit monitor the chlorine residual and notify the Band Office when the water has been disinfected.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W09**

ASSET	Community Curb Stops	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Curb box/stop		
TASK DESCRIPTION	Curb Box and Curb Stop Repairs	**RECEIVED BY:**	
FREQUENCY	As needed (est. 6 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Curbstops throughout community		
WORK LOCATION	Throughout community		

WORK DESCRIPTION	Curb Box and Curb Stop Repairs
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, backhoe, compressor and blowpipe, tamper, hand tools
MATERIALS REQUIRED	Varies with repair

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	6.0	$ 31.00	$ 186.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 25.00	$ 25.00
		LABOR TOTAL	**$ 211.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W09**

WORK DESCRIPTION

- ❑ Check equipment before leaving yard to ensure it is in working condition.
- ❑ Proceed to designated area and set out required safety devices and signs.
- ❑ Blow out curb box with compressor. Note: If curb box requires repair proceed as follows:
- ❑ Obtain location of utilities from telephone, gas, and hydro companies if required.
- ❑ Remove sod as required, and excavate and expose curb box foot and curb stop.
- ❑ Check condition and carry out necessary repairs.
- ❑ Backfill excavation with native soil, compact with tamper in 300mm lifts to grade.
- ❑ Repair surface to original, remove equipment, and clean up area.
- ❑ As required: locate, mark, and paint each house connection to curb stop valve box.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W10**

ASSET	Community Fire Hydrants	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Fire Hydrant and Standpipe		
TASK DESCRIPTION	Fire Hydrant and Standpipe Test	**RECEIVED BY:**	
FREQUENCY	3 times per year (every 3 months except in winter)	(est. 2 labor hrs/hydrant)	
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Hydrants throughout community		
WORK LOCATION	Hydrants throughout community		

WORK DESCRIPTION	Fire Hydrant and Standpipe Test
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Hydrant wrench / hydrant pump, valve key
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	30.0	$ 31.00	$ 930.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 930.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W10**

WORK DESCRIPTION

- ❑ Test the operation and condition of each hydrant.
- ❑ Locate and open the valve to the main. Adjust the valve box to a level slightly above the adjacent ground or 150mm below grade in travelled roadway. Paint the valve box with yellow epoxy.
- ❑ Check the standpipes for water tightness, listen to the valve key for the sound of running water indicating underground leakage. If leakage is detected or suspected, schedule standpipe for repair.
- ❑ Check hydrant for completeness of cap. Replace if necessary.
- ❑ Attach fire hose to hydrant (standpipe) and run to nearest ditch.
- ❑ Locate open 150L drum adjacent to ditch.
- ❑ Slowly open hydrant valve directing fire hose into ditch. Ensure air gap is maintained between nozzle and any part of manhole to prevent contamination of nozzle. On completion treat nozzle liberally with bleach to disinfect.
- ❑ Direct hose discharge into empty 150L barrel, and record in seconds the time required to fill the barrel.
- ❑ A. 150L in _____sec = _____L/s
- ❑ B. 150L in _____sec = _____L/s
- ❑ C. 150L in _____sec = _____L/s

- ❑ Note size of fire hose and nozzle hose diameter
- ❑ Hose diameter _____mm
- ❑ Nozzle diameter_____mm
- ❑ Distance from standpipe to nozzle _____m
- ❑ Direct fire flow stream to its maximum horizontal distance to an area that is level with the operator. Measure the maximum distance travelled by the fire stream.
- ❑ Horizontal drop _____m
- ❑ A. Maximum distance _____m
- ❑ B. Maximum distance _____m
- ❑ C. Maximum distance _____m
- ❑ Allow fire stream into the ditch for a five minute period, taking care to prevent contamination of the nozzle.
- ❑ Close hydrant slowly. Wait five minutes for hydrant body to drain before replacing cap. Test to ensure hydrant has drained. If hydrant does not drain, note for repair.
- ❑ Empty test barrel, replace manhole cover, and grease.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W11**

ASSET	Water Valves	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Valve		
TASK DESCRIPTION	Valve Repair	**RECEIVED BY:**	
FREQUENCY	As required (est. 8 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Water valves throughout community		
WORK LOCATION	Throughout community		

WORK DESCRIPTION	Valve Repair
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, valve key, backhoe, compactor, mud pump, misc. hand tools
MATERIALS REQUIRED	Valves, repair clamps, sand bedding

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	8.0	$ 31.00	$ 248.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 25.00	$ 25.00
		LABOR TOTAL	**$ 273.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W11**

WORK DESCRIPTION

- ❑ Check equipment before leaving yard.
- ❑ Obtain location of sewer and water lines and connections.
- ❑ Notify Band Office and fire department of water service interruption.
- ❑ Excavate and remove extra fill, expose valve, and check condition.
- ❑ Shut off appropriate valves.
- ❑ Remove bonnet, spindle, and gates. Check condition.
- ❑ Cut out obsolete valve if it cannot be repaired on site. Install new valve of required size with MOA pipe and repair clamps.
- ❑ Re-open main valves and check for leaks. If leakage exists, shut off valves and make repairs as necessary. Repeat to confirm leakage is resolved.
- ❑ Blow out designated hydrants and pump out.
- ❑ Place 450mm of granular material as bedding for the valve. Backfill excavation with native soil 200mm layers and compact each layer with tamper.
- ❑ Repair surface as necessary and clean up area.
- ❑ Notify Band Office, consumers, and fire department that work is complete.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W12**

ASSET	Community Fire Hydrants	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Hydrant		
TASK DESCRIPTION	Hydrant Repair (General)	**RECEIVED BY:**	
FREQUENCY	As required (est. 8 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Hydrants throughout community		
WORK LOCATION	Hydrants throughout community		

WORK DESCRIPTION	Hydrant Repair (General)
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, backhoe, compactor, mud pump, hand tools
MATERIALS REQUIRED	Varies by repair

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	8.0	$ 31.00	$ 248.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 25.00	$ 25.00
		LABOR TOTAL	**$ 273.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W12**

WORK DESCRIPTION

- ❑ Check equipment before leaving yard.
- ❑ Notify Band Office, consumers, and fire department of water service interruption.
- ❑ Shut off necessary main valves.
- ❑ Excavate to expose hydrant lead and carry out necessary repairs.
- ❑ Open main valves and check for leakage. If leakage is observed, close main valves and carry out required repairs. Repeat until no leakage is observed.
- ❑ Backfill excavation with native soil in 200mm layers and compact each layer with a compactor. Repair surface and clean up area.
- ❑ Notify Band Office and fire department of work completion.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W14**

ASSET	Community Fire Hydrants	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Hydrant		
TASK DESCRIPTION	Hydrant Painting	**RECEIVED BY:**	
FREQUENCY	Every 3 years (est. 0.5 labour hr/hydrant)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Hydrants throughout community		
WORK LOCATION	Hydrants throughout community		

WORK DESCRIPTION	Hydrant Painting
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, paint brushes, rags, number stencils
MATERIALS REQUIRED	Paint

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	9.5	$ 31.00	$ 294.50
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 10.00	$ 10.00
Parts + Materials		$ 125.00	$ 125.00
		LABOR TOTAL	**$ 429.50**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W14**

WORK DESCRIPTION
❑ Paint fire hydrants fire red. ❑ After paint has dried (next day), paint yellow identification numbers on hydrants.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT04**

ASSET	Community Water Treatment Plant	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Daily Inspection	**RECEIVED BY:**	
FREQUENCY	Daily (7 days/week) (est. 0.5 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Water Treatment Plant		
WORK LOCATION	Water Access Rd.		

WORK DESCRIPTION	Daily Inspection (7 Days per Week)
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.5	$ 31.00	$ 15.50
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 15.50**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT04**

WORK DESCRIPTION
❑ Record turbidity, colour, and chlorine residual ❑ Adjust chlorine feed rate if necessary

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT06**

ASSET	Community Water Treatment Plant	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Periodic Inspection and Test	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 2 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Water Treatment Plant		
WORK LOCATION	Water Access Rd.		

WORK DESCRIPTION	Water Treatment Plant Periodic Inspection and Test
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	2.0	$ 31.00	$ 62.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 10.00	$ 10.00
		LABOR TOTAL	**$ 72.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT06**

WORK DESCRIPTION
❑ Conduct periodic jar tests to optimize alum dosage and adjust alum feed pump accordingly ❑ Once per week measure pH, alkalinity, and hardness of trated water

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT07**

ASSET	Community Water Treatment Plant	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Filter Scraping	**RECEIVED BY:**	
FREQUENCY	6 times/year (est. 16 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Water Treatment Plant		
WORK LOCATION	Water Access Rd.		

WORK DESCRIPTION	Filter Scraping
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, shovels, wheelbarrow
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	16.0	$ 31.00	$ 496.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 200.00	$ 200.00
Parts + Materials		$ 100.00	$ 100.00
		LABOR TOTAL	**$ 796.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT07**

WORK DESCRIPTION

- ❑ NOTE: All equipment should be clean and shovels, boots, and wheelbarrows should be dedicated solely for this task to avoid possible contamination of the filters.
- ❑ Shut off inflow to filter to be scraped
- ❑ Decant unfiltered water to just above sand surface by opening filter draw down valve to drain
- ❑ Lower water to 30cm below filter sand surface using underdrain valve
- ❑ Lay 25mm x 250mm planks across filter sand for working surface; do not walk on unscraped filter sand
- ❑ Remove top 1 to 2cm of sand using square headed shovel and wheelbarrow and discard
- ❑ Rake sand level
- ❑ Slowly refill filter by backfeeding from bottom through underdrain with filtered water from active filter to just above sand
- ❑ Fill filter part way up with unfiltered water input through draw down line
- ❑ Fill and run filter using raw water inlet line
- ❑ Waste filtered water until good quality water is being produced

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT08**

ASSET	Community Water Treatment Plant	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Media Addition	**RECEIVED BY:**	
FREQUENCY	Every 6 years (est. 60 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Water Treatment Plant		
WORK LOCATION	Water Access Rd.		

WORK DESCRIPTION	Water Treatment Plant Media Addition
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, bobcat
MATERIALS REQUIRED	Sand

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	60.0	$ 31.00	$ 1,860.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 200.00	$ 200.00
Parts + Materials		$ 1,000.00	$ 1,000.00
		LABOR TOTAL	**$ 3,060.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT08**

WORK DESCRIPTION
❑ Follow WT07 for scraping filter ❑ After scraping filter, further drain underdrain piping by opening filter drain valve to waste (if necessary for inspection of underdrains etc.) ❑ Resand filter and spread evenly ❑ Follow procedure in WT07 for refilling filter after scraping

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS01**

ASSET	Steel Water Reservoir	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Weekly Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 1 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Steel Water Reservoir		
WORK LOCATION	North of community, end of Reservoir Rd.		

WORK DESCRIPTION	Daily or Weekly Inspection of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0	$ 31.00	$ 31.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 31.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS01**

WORK DESCRIPTION

- ❑ Check any warning lights or alarms - low water level, hight water level, intrusion, power outage, and so on.
- ❑ Check storage tank for signs of security breaches - damaged fences, open gates, graffiti, vandalism, etc.
- ❑ Check water level indicator - functioning, adequate amount of stored water, excessive water use.
- ❑ Check the overflow line, vents, ladder access locks, roof access hatches, and controls that are readily visible from the ground for damage, vandalism, or other conditions.
- ❑ Check storage tank and site after any adverse weather - high winds, heavy snow, ice, rains, etc.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS02**

ASSET	Steel Water Reservoir	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Monthly Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 3 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Steel Water Reservoir		
WORK LOCATION	North of community, end of Reservoir Rd.		

WORK DESCRIPTION	Monthly Inspection and maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	3.0	$ 31.00	$ 93.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 10.00	$ 10.00
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 153.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS02**

WORK DESCRIPTION
❑ Check water level indicator ❑ Verify all openings are protected from surface runoff, windblown contaminants, insects, birds and animals. ❑ Check tank overflow lines for signs of damage, such as, screens, flapper valves, check valves, splash plate, etc. ❑ Check area for excessive vegetation or dangerous conditions - uncut grass, brush, dead trees, fire hazard, etc. ❑ Check control valves for proper positions, open or closed ❑ Check control valves for damage or leaks. ❑ Check low water temperature alarm - cold weather only. ❑ Check high water temperature limit switch - when heating system in service.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS03**

ASSET	Steel Water Reservoir	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Quarterly Inspection	**RECEIVED BY:**	
FREQUENCY	Quarterly (est. 3 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Steel Water Reservoir		
WORK LOCATION	North of community, end of Reservoir Rd.		

WORK DESCRIPTION	Quarterly Inspection and maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	3.0	$ 31.00	$ 93.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 10.00	$ 10.00
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 153.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS03**

WORK DESCRIPTION

- ❑ Check water level indicator
- ❑ Visually inspect tank exterior and roof for signs of damage, corrosion, degradation, leakage or structural problems, with particular focus on all openings into the reservoir (reservoir roof and sidewall vents access hatch, overflow outlet, and so on.)
- ❑ Check tank-supporting structure for signs of damage, corrosion, degradation, structural inadequacy.
- ❑ Tank catwalks/ladders free from signs of damage, corrosion, degradation, structural condition, vandalism, etc.
- ❑ Tank area for water ponding, poor drainage areas, excessive vegetation, unhealthy trees, fire hazards, etc.
- ❑ Tank area free from combustible storage, trash, debris, brush, or other material that could present a fire hazard.
- ❑ Tank area free of accumulation of material on or near parts possibly resulting in accelerated corrosion or rot.
- ❑ Tank and support free of ice buildup.
- ❑ Check earth embankments for erosion, burrowing animals, improper drainage and leakage.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS04**

ASSET	Steel Water Reservoir	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Annual Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 4 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Steel Water Reservoir		
WORK LOCATION	North of community, end of Reservoir Rd.		

WORK DESCRIPTION	Annual Inspection and maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Tools for exercising valves, Inventory, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	4.0	$ 31.00	$ 124.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 10.00	$ 10.00
Parts + Materials		$ 100.00	$ 100.00
		LABOR TOTAL	**$ 234.00**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Ergonomics (MSI) Requirements
- ❑ Personal Protective Clothing and Equipment

WORK ORDER **WS04**

WORK DESCRIPTION
❑ Check storage tank structural, seismic and sanitary integrity - leaks, corrosion, cracks, supports, warping, etc. ❑ Inspect storage tank interior for pitting, concrete spalling, rot, corrosion, rust, water level sensors, biofilm build-up etc. ❑ Exercise valves and make repairs as needed. ❑ Inventory and evaluate storage facilities capacity, condition, replacement costs and plan for improvements. ❑ Evaluate stored water for clarity, sediments, floating materials or films, unusual odors, insects birds or animals. ❑ Plan for storage facility improvements and budget for the associated costs.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS05**

ASSET	Steel Water Reservoir	**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Three Year Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Every 3 Years (est. 8 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Steel Water Reservoir		
WORK LOCATION	North of community, end of Reservoir Rd.		

WORK DESCRIPTION	Three to Five Year Inspection and Maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	8.0	$ 31.00	$ 248.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 200.00	$ 200.00
		LABOR TOTAL	**$ 498.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS05**

WORK DESCRIPTION

- ❑ Tank indicator inspected - every three years for steel storage tanks without corrosion protection
- ❑ Tank indicator inspected - every five years for storage tanks other than steel without corrosion protection
- ❑ Drain, inspect, clean, and disinfect storage tank or use a diving maintenance service without draining tank.
- ❑ Respond to any evidence of storage tank problems.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST03**

ASSET	Community Septic Tank	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Septic Tank / Field (Type 1)		
TASK DESCRIPTION	Septic Tank Pumping	**RECEIVED BY:**	
FREQUENCY	As Required (est. 1 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Septic Tank		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Septic Tank Pumping
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0	$ 31.00	$ 31.00
Maintenance Assistant			$ -
Truck			$ -
Contractor		$ 500.00	$ 500.00
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 531.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST03**

WORK DESCRIPTION

- ❑ Retain certified septic tank pumping company to pump tanks as required.
- ❑ Ensure that tanks pumped during winter conditions are refilled immediately and that all plastic tanks are refilled immediately.
- ❑ Pumping out of the tank should be shceduled at the most fabourable time of the year in terms of freezing temperatures and groundwater.
- ❑ Some digestion of sludge and reduction of sludge volume occurs after approximately 3 years, it is therefore not appropirate to pump out tanks when pumping is not required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST04**

ASSET	Community Septic Tank	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Septic Tank / Field (Type 1)		
TASK DESCRIPTION	Quarterly Septic Tank and Field Inspection	**RECEIVED BY:**	
FREQUENCY	Quarterly (est. 1 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Septic Tank		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Quarterly Septic Tank and Field Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0	$ 31.00	$ 31.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 131.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST04**

WORK DESCRIPTION

- ❑ Visually inspect for sludge and scum accumulations. Inspect for clogging, damage, and proper placement of outlet baffle and filter. Clean filter and replace if damaged or deteriorating.
- ❑ Record signs of leaking or infiltration in tanks, penetrations, and risers. Repair or replace as necessary.
- ❑ Look for signs of overflow/seepage probelms
- ❑ Ensure risers and lids are above grade with secure lids, and surface water is directed away from lids.
- ❑ Ensure floats are functioning properly. Check that float actuates alarm when moved to "on" position. Clean and repair as necessary.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST05**

ASSET	Community Septic Tank	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Septic Tank / Field (Type 1)		
TASK DESCRIPTION	Bi-Annual Septic Tank and Field Inspection	**RECEIVED BY:**	
FREQUENCY	Bi-Annual (est. 3 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Septic Tank and Field		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Bi-Annual Septic Tank and Field Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	3.0	$ 31.00	$ 93.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment		$ 50.00	$ 50.00
Parts + Materials		$ 300.00	$ 300.00
		LABOR TOTAL	**$ 443.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST05**

WORK DESCRIPTION

- ❑ Visually inspect for sludge and scum accumulations. Pump when sludge and scum thickness total 1/3 of the depth of the tank or as directed in the maintenance plan.
- ❑ Inspect for clogging, damage, and proper placement of outlet baffle and filter. Clean filter and replace if damaged or deteriorating.
- ❑ Record signs of leaking or infiltration in tanks, penetrations, and risers. Repair or replace as necessary.
- ❑ Look for signs of overflow/seepage probelms
- ❑ Ensure risers and lids are above grade with secure lids, and surface water is directed away from lids.
- ❑ Ensure floats are functioning properly. Check that float actuates alarm when moved to "on" position. Clean and repair as necessary.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST06**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Effluent pump station, RBC Module, secondary clarifiers, chlorination equipment, dechlorinator		
TASK DESCRIPTION	Sewage Treatment Plant Inspection	**RECEIVED BY:**	
FREQUENCY	Daily (est. 0.25 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Sewage Treatment Plant Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	Chlorine tablets, sodium thiosulphate

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.25	$ 31.00	$ 7.75
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 7.75**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST06**

WORK DESCRIPTION
❑ Check that all components are secure and that there is no sign of vandalism. ❑ Check that all switches on the control panel are in their proper operating position. ❑ Check that all components are operating. ❑ Check for signs of leakage. ❑ Check chlorinator. Add chlorine tablets when required. Ensure that tablets lie flat. ❑ Check sodium thiosulphate level. Replenish when required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST07**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Effluent pumps, chamber		
TASK DESCRIPTION	Effluent Pump Station Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.5 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Effluent Pump Station Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.5	$ 31.00	$ 15.50
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 15.50**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST07**

WORK DESCRIPTION

- ❑ Inspect system to ensure that pumps are cycling properly in automatic mode.
- ❑ Record pump hours for each pump.
- ❑ Ensure that the float switches are hanging freely and are clear of debris.
- ❑ Simulate pump operations by raising floats to ensure proper operation.
- ❑ Remove any obstacles which may cause blockage of pumps.
- ❑ NOTE: Pumps should be serviced annually by a qualified Contractor.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST08**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Effluent pump chamber, overflow return line		
TASK DESCRIPTION	Effluent Pump Station Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 1 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Effluent Pump Station Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, hose
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0	$ 31.00	$ 31.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 31.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST08**

WORK DESCRIPTION
❑ Carry out weekly inspection (ST08). ❑ Flush out overflow return line. ❑ Hose down interior of chamber. ❑ NOTE: Shut down RBC drive if flushing from RBC bucket chamber.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST09**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	RBC Unit		
TASK DESCRIPTION	RBC Module Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 1 labor hr)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	RBC Module Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, grease gun, misc. hand tools
MATERIALS REQUIRED	Lubricant, oil

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0	$ 31.00	$ 31.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 10.00	$ 10.00
		LABOR TOTAL	**$ 41.00**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ Manufacturer's Instructions

WORK ORDER **ST09**

WORK DESCRIPTION

- ❑ Check to ensure that sludge is not accumulating in the RBC chamber.
- ❑ If sludge has accumulated, schedule pump out at time of septic tank pump out.
- ❑ Do not wash down RBC discs.
- ❑ Check chain drive oil bath, replenish as required.
- ❑ Every three (3) months the roller bearing must be greased. Refer to manufacturer's brochures for information.
- ❑ NOTE: any major servicing required should be carried out by a qualified Contractor. Shut down RBC drive prior to carrying out any servicing.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST10**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Secondary clarifiers, sludge return pumps, pipe		
TASK DESCRIPTION	Secondary Clarifiers Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Daily (est. 0.5 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Secondary Clarifiers Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, squeegee
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.5	$ 31.00	$ 15.50
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 15.50**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST10**

WORK DESCRIPTION

- ❑ Monitor sludge accumulation and adjust frequency of sludge return pump operation as necessary.
- ❑ Gently brush any sludge from walls of chamber to bottom.
- ❑ Skim and dispose of any scum floating on surface or accumulated against baffle.
- ❑ Check air vacuum valve for free operation and flush with clean water as required.
- ❑ NOTE: No adjustment of pumps during inspection and maintenance is required. Once per year thet pumps should be serviced by a qualified Contractor.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST11**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Chlorinators, chlorine contact tank		
TASK DESCRIPTION	Chlorinators and Tank Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.25 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Chlorinators and Tank Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, chlorine test kit
MATERIALS REQUIRED	Chlorine tablets

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.25	$ 31.00	$ 7.75
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 10.00	$ 10.00
		LABOR TOTAL	**$ 17.75**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST11**

WORK DESCRIPTION

- ❑ Carry out daily tasks.
- ❑ Monitor chlorine residual at outlet from contact chamber and adjust number of tubes in use as appropriate.
- ❑ Check that nothing is floating in the tank.
- ❑ Check quantity of chlorine tablets and reorder as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST12**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Chlorinators, chlorine contact tank		
TASK DESCRIPTION	Chlorinators and Tank Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 2 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Chlorinators and Tank Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	Chlorine

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	2.0	$ 31.00	$ 62.00
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 50.00	$ 50.00
		LABOR TOTAL	**$ 112.00**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST12**

WORK DESCRIPTION

- ❑ Drain chlorine contact tank.
- ❑ Rinse baffles and walls and flush out any solids which have settled.
- ❑ Inspect baffles for any sign of damage.
- ❑ Refill tank.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST13**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Dechlorination vat and pump		
TASK DESCRIPTION	Dechlorinator Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.25 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Dechlorinator Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, chlorine test kit
MATERIALS REQUIRED	Sodium thiosulphate

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.25	$ 31.00	$ 7.75
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 20.00	$ 20.00
		LABOR TOTAL	**$ 27.75**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST13**

WORK DESCRIPTION
❑ Carry out daily tasks. ❑ Check pump to ensure that pump operates when flow passes through works. ❑ Test effluent to ensure that chlorine residual is neutralized and adjust dechlorination pump as necessary. ❑ Check quantity of sodium thiosulphate and reorder as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST14**

ASSET	Community Sewage Treatment Plant	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Flow Recorder		
TASK DESCRIPTION	Flow Recorder Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.5 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Flow Recorder Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	Flow recording strip

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.5	$ 31.00	$ 15.50
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials		$ 5.00	$ 5.00
		LABOR TOTAL	**$ 20.50**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ **Wastewater Systems Effluent Regulations** [https://www.gazette.gc.ca/rp-pr/p2/2012/2012-07-18/html/sor-dors139-eng.html]

WORK ORDER **ST14**

WORK DESCRIPTION

- ❑ Replace flow recording strip as required (once every 30 days)
- ❑ Check recorder float to ensure free operation of mechanism.
- ❑ Replace pen as required.
- ❑ Record date and total flow.
- ❑ Calibrate flow recorder if required. As per Wastewater Systems Effluent Regulations, monitoring equipment must be calibrated at least once in every calendar year.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST15**

ASSET	Sanitary Outfall	**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Outfall pipe		
TASK DESCRIPTION	Outfall Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 0.25 labor hrs)		
KEY CONTACTS	Kathy Kristianson 250-555-1234		
ASSET DESCRIPTION	Community Sewage Treatment Plant		
WORK LOCATION	Bottom of 1st St. at Waterfront Rd.		

WORK DESCRIPTION	Outfall Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	0.25	$ 31.00	$ 7.75
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ 7.75**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST15**

WORK DESCRIPTION
❑ Check and make sure that sewage is not backing up due to a blockage in the line. ❑ During low tides check that the pipe has not been damaged. ❑ Collect sample of effluent and send for testing as required by Wastewater Systems Effluent Regulations. ❑ Any required maintenance should be carried out by a qualified Contractor.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

APPENDIX D - *Example MMP*

Reporting

Appendix 1. Asset Record Card

Asset Name:	Location:		
ID No:	General Description/function:		
Model No:			
Serial No:	O&M Manual Ref.:		
Installation Date:	Manufacturer's Manual:		
Contractor:	Installer:		
Manufacturer: Name: Address: Phone No.: e-mail:	Local Service Provider: Name: Address: Phone No.: e-mail:		
Key Specifications: ▶ ▶ ▶ ▶ ▶	Warranty Dates: ▶ ▶ ▶ ▶ ▶		
Key Design Info: ▶ ▶ ▶	Key Field Values: ▶ ▶ ▶		
Preventative Maintenance Tasks	Frequency	Task Description Card No.	
☐			
☐			
☐			
☐			
☐			
Spare Parts	Local Supplier		Phone No.
▶			
▶			
▶			
▶			

Appendix 5 – Supplementary Templates

In addition to the generic "essential" MMP templates provided and explained in this Guide, this appendix provides further templates that you may find useful, especially when recording information on specific asset types.

Generic Description of System

Owner				
First Nation				
Address				
City				
Postal code				
Responsible Officials				
Name (s)				
Title				
Address				
Telephone No.				
City				
Email				

Service Area Map
Location of Map

Permit Information			
Permit No.	Issue Date	Permit Location	Purpose

Treatment System Information		
Facility Name		
Treatment System Schematic Attached	Yes ☐	No ☐

Schematic Indicates (Check those that apply):			
Sources of Supply ☐	Raw Water Taps ☐	Contact Tanks ☐	Other ☐
Chemical Treatment Injection Points ☐	Finished Water Taps ☐	Entry Points ☐	

Treatment System Schematic	
Facility Name	

System Card / Equipment List

Equipment No.	Equipment Description	Equipment Location

Asset / Equipment Record Card

Equipment Registration	
Equipment Name	Equipment No.
Location	
Manufacturer	
Address	
City	
Postal Code	
Sales Representative	
Telephone Number	
Email	
Manufacturer's Manual No.	
Telephone Number	
Name Plate Data	Motor Data

Maintenance Required	Maintenance Type	Frequency

Contracted Labour	Address	Telephone

Maintenance Activities Performed	Date	Comments

Spare Part	Part No.	No. in Stock	Manufacturer	Telephone

Asset / Equipment Specifications- Well	
Well No. 1 (Complete for Each Well)	
Not Applicable	☐
Name or Identification	
Permit No.	
Date of Permit	
Location	
Latitude	
Longitude	
Well Log Attached	☐ Yes ☐ No
Date Drilled	
Well Driller	
Total Well Depth	m
Casing Length	m
Diameter	mm
Casing Diameter	m
Casing Grouted	☐ Yes ☐ No
Depth of Grout	m
Pumping Capacity	L/s
Pumping Water Level	m
Static Water Level	m
Depth Gauge	Yes ☐ No ☐

Pumps		
Not Applicable	☐	
Name /Location		
Size (Size of Suction Piping x Size of Discharge Piping)	mm	
Capacity	L/s	
Head	m	
Manufacturer		
Model No.		
Pump Specifications Attached	☐ Yes ☐ No	
Impeller Diameter	mm	
Pump Curve		
Suction Pressure	psi	
Discharge Pressure	psi	
Metered	☐ Yes ☐ No	
Motor Manufacturer		
Motor Serial No.		
Horsepower		
RPM		
Volts		
Amps		
Phase		
Motor Frame No.		
Controls	Manual ☐	Automatic ☐

Treatment			
Disinfection Unit			
Chemical Supplier			
Address			
City			
Postal Code			
Contact Person			
Telephone No.			
Email			
Chemical Used			
Strength	%		
Container Size	L/kg		
Type of Chemical Feeder			
Equipment No.			
Manufacturer			
Model No.			
Pump Specifications Attached	Yes ☐ No ☐		
Capacity	L/s		
Pressure	psi		
Chemical Feeder is Equipped With (Check those that apply):			
Pressure Relief Valve ☐	De-gassing Valve ☐	Calibration Chamber ☐	
Anti-siphon Valve ☐	Foot Valve ☐	Backpressure Valve ☐	
Contact Time min.	At Flow Rate L/s		
Contact tank or Clearwell Volume	m^3		
Transmission Pipe	Diameter mm	Length m	
Controls	Manual ☐	Automatic ☐	

Other Treatment Unit		
Purpose		
Chemical Used		
Container Size	L/kg	
Strength	%	
Chemical Supplier		
Address		
City		
Postal Code		
Contact Person		
Telephone No.		
Type of Chemical Feeder		
Equipment No.		
Manufacturer		
Model No.		
Feeder Specifications Attached	Yes ☐ No ☐	
Capacity	L/s	
Pressure	psi	
Chemical Feeder is Equipped With (Check those that apply):		
Pressure Relief Valve ☐	De-gassing Valve ☐	Calibration Chamber ☐
Anti-siphon Valve ☐	Foot Valve ☐	Backpressure Valve ☐
Method Used for Process Control		

Distribution System		
Location of Distribution Map		
Distribution Map Indicates (Check those that apply)		
Pipe Material ☐	Fire Hydrants ☐	Pipe Length ☐
Pipe Diameter ☐	Dead Ends ☐	Valves ☐
Valves Open	Left ☐	Right ☐
Fire Hydrants Open	Left ☐	Right ☐
Pressure Regulation Valve		
Location		
Manufacturer		
Size		
Do you maintain records of residential meters? Yes ☐ No ☐		
Where are they located?		
Do you maintain an inventory of distribution materials such as pipes, valves, etc.? Yes ☐ No ☐		
Where are they located?		

Water Storage				
Not Applicable	☐			
Tank Manufacturer				
Address				
City				
Postal Code				
Telephone No.				
Email				
Type				
Location				
Capacity	m^3			
Dimensions				
If Elevated Tank	Height m	Diameter m		
If Reservoir	Height m	Width m	Depth m	
Elevations	Base m	Overflow m		
Pipe Size	Inlet m	Outlet m		
Year Constructed				
Type Foundation				
Type of Construction				
Type of Paint System				
Storage Facility is Equipped With (Check those that apply)?				
Water Level Recorder ☐	Overflow Pipe ☐	Float Gauge ☐	Fence ☐	
Altitude Valve ☐	Exterior Ladder ☐	Pump Controls ☐	Drain Pipe ☐	
Interior Ladder ☐	Other ☐			

Valve Record

Water Supplier	
Location	
Number	
Make	
Size	
No. of Turns (New)	
Direction to Open	Left ☐ Right ☐
Date Installed	
Installed by	

Date Inspected	Condition	Turns to Open	Turns to Close	Maintenance and Remarks	Done By

Fire Hydrant Record

Water Supplier	
Location	
Number	
Make	
No. of Outlets	
Hose	
Streamers	
Hydrant Size	
Size Valve Openings	
Lateral Size	
Lateral Valve Size	
Direction to Open	
Date Installed	
Installed By	

Date Inspected	Condition	Turns to Open	Turns to Close	Maintenance and Remarks	Done By

Corrective Maintenance Work Order

Date of Work	Due Date	Priority (H-M-L)	Plant Area	Equipment Number	Equipment Name	Location

Nature of Problem								
Requested By	Phone Number	Estimated Man Hours						
			Job Started					
			Month		Day		Time	
			Job Completed					
			Month		Day		Time	

Materials					**Labour/Equipment**				
Stock No.	Item	Qty.	Unit Price	Total	Name	Reg. Hours	O.T. Hours	Rate	Total
Total					Total				

Outside Contractor Required	Yes☐	No☐	If Yes, Name	
Contractor Cost				
What Was Found Wrong?				
How Was It Fixed?				
Apparent Cause of Problem				
Remarks				
Work Completed By		Date		
Work Accepted By		Date		

Maintenance Procedure Form

Maintenance Procedure Title	
Maintenance Description	
Equipment Name	
Equipment No.	
Location	
Job Safety Analysis	
Tools, Parts, Materials and Test Equipment	
Procedure	
Checklist	

Task	Description
☐ Task 1	
☐ Task 2	
☐ Task 3	
☐ Task 4	
☐ Task 5	
☐ Task 6	
☐ Task 7	

Preventive Maintenance Schedule and Checklist

Plant Location				
Month				
Week				
Today's Date	Equipment No.	Equipment Name	Procedure	Initials

- END OF EXAMPLE MMP -

APPENDIX B

Work Order Library

WORK ORDER **S01**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity Main		
TASK DESCRIPTION	Annual Sanitary Main Inspection	**RECEIVED BY:**	
FREQUENCY	Annual (est. 7.9 labor hours/km of sanitary main)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual inspection of sanitary main, manhole and sewer flow
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Traffic Cones, Safety Harness, Spotlight, Mirrors, Power Rodder
MATERIALS REQUIRED	Yellow Epoxy Paint, Cement/Grout

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:

❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Illumination
❑ Personal Protective Clothing and Equipment
❑ Confined Spaces
❑ Traffic Control

WORK ORDER **S01**

WORK DESCRIPTION
❑ Review all equipment before leaving workshop ❑ Barricade off all work area when in traffic areas. ❑ Note conditions of manhole structure especially infiltration at joints and around frame, repair with waterproofing cement grout. ❑ Prepare list of observed maintenance and repair work required. ❑ Inspect interior of sewer pipe. If there is evidence of siltation or the accumulation of solids, use rodding equipment to remove or engage qualified contractor. Additionally note any areas which are in need of possible repairs.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S02**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity Main		
TASK DESCRIPTION	Main Flushing and Cleaning	**RECEIVED BY:**	
FREQUENCY	Every 3 Years (est. 11.4 labor hours/km of sanitary main)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Flushing of sanitary main every 5 years
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Jet Cleaning Ball, Poly Rope, Manhole Jack, Hand Pump, Fire Hose, Hydrant Wrench, Manhole lifter, 2.5" Valve
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment
❑ Traffic Control

WORK ORDER **S02**

WORK DESCRIPTION

- ❑ This task is to be coordinated with watermain hydrant flushing task.
- ❑ Start at the head of each sewer run and proceed to work downstream.
- ❑ Open manhole cover and downstream manhole cover and ventilate as required.
- ❑ Connect hose to fire hydrant valve and backflow preventer. Hold the nozzel firmly at the top of the manhole. Never place the fire hose directly into the manhole.
- ❑ Have the same person operate all the hydrants as the cleaning progresses. It is very important to have a separate person with clean clothing handling the hydrants to avoid contamination of the water system.
- ❑ Starting from the upstream sanitary manhole, flush each sanitary main until water runs clear in downstream manhole.
- ❑ Pack up equipment, turn off hydrants, and proceed to the next manhole to flush the next pipe section. Repeat until all sewers and manholes have been cleaned.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S03**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity and Force Mains		
TASK DESCRIPTION	CCTV Inspection	**RECEIVED BY:**	
FREQUENCY	Every 10 Years (est. 2.2 labor hours/km of sanitary main)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	CCTV Inspection of Sanitary Distribution and Collection Mains
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Traffic Cones
MATERIALS REQUIRED	N/A

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment
❑ Traffic Control

WORK ORDER **S03**

WORK DESCRIPTION
❑ Retain certified CCTV inspection company to perform inspection of system. ❑ Supervise inspection, update maintenance log noting any required repairs.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S04**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Gravity and Force Mains		
TASK DESCRIPTION	Vac Truck	**RECEIVED BY:**	
FREQUENCY	As Required		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Vac Truck
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Traffic Cones
MATERIALS REQUIRED	N/A

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ N/A

WORK ORDER **S04**

WORK DESCRIPTION
❑ Retain certified Vac Truck company for service as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S05**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Force Mains		
TASK DESCRIPTION	Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 1.25 labor hrs/km of forcemain)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual Force Main Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Shovel
MATERIALS REQUIRED	N/A

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Ergonomics (MSI) Requirements
- ❑ Personal Protective Clothing and Equipment
- ❑ Confined Spaces

WORK ORDER **S05**

WORK DESCRIPTION
❑ Walk along all forcemain right-of-ways and check for signs of dampness, or accumulation of water which may indicate leakage. Check notable trench settlement, indicating material washout and potential leak. If potential leak is suspected, dig out immediate area by shovel, sufficient to confirm leak present. ❑ Note: Forcemain cleanout chamber is a confined space - do not enter. ❑ Open cover to forcemain cleanout chamber and vent as required. ❑ From ground level, note any leakage from valve or joints.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S06**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Backflow Preventor		
TASK DESCRIPTION	Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 1 labour hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Backflow Preventor/Double Check Valve inspection by certified inspection and service crew
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	N/A

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment
❑ Confined Spaces

WORK ORDER **S06**

WORK DESCRIPTION
❑ Contract certified service technicians shall carry out a complete inspection and servie of backflow preventer and double check valve. ❑ Observe tasks performed by qualified service technicians, and make notes.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **S07**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Wastewater Air Release Valve		
TASK DESCRIPTION	Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Bi-Annual (est. 0.5 labour hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Inspection and maintenance of Air Release Valves at sanitary system high points
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	N/A

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment
❑ Confined Spaces

WORK ORDER **S07**

WORK DESCRIPTION
❑ Carry out an inspection to verify operation of each Air Release Valve. ❑ Check unit and pipe connections for any leakage. ❑ With the inlet shut-off valve open, partially open the drain valve until flow can be heard. If the Air Release Valve is working properly, water should be exhausted from the drain valve. If a large amount of air is exhausted, valve requires backwash procedure and/or service. ❑ Contract certigied service technicians to trouble-shoot the cause and rectify.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS01**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Weekly Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Visual and auditory inspection of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	Generator Fuel

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **LS01**

WORK DESCRIPTION
❑ Visually/audibly inspect the lift station. Check for signs of damage/vandalism. ❑ Record pump hours for each pump. Check for uneven pump run times. ❑ Wash down the wet well. ❑ Check for sand and sludge accumulation. ❑ Check for indication of high water levels. ❑ Inspect lights and alarm systems. ❑ Ensure adequate fuel levels in the generator and ensure no fluid leaks. ❑ Complete inspection form

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS02**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Monthly Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 1.5 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Visual and auditory inspection of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ Additional Work Orders: **GEN01**

WORK ORDER **LS02**

WORK DESCRIPTION
❑ Visually inspect each pump for proper pumping (run each pump by manual control, watch level rise and fall.) ❑ Pump down wet well to lowest point, and make visual inspection. ❑ Check wet well floats. ❑ Exercise suction and discharge valves. ❑ Test back-up generator - check engine coolant and oil level and battery charger. **SEE WORK ORDER GEN01** ❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS03**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Quarterly Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Quarterly (Every Three Months) - est. 3 labor hrs		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Visual and auditory inspection of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **LS03**

WORK DESCRIPTION
❑ Remove excessive grit & grease with VAC truck (if required). ❑ Test generators, under load, for 15 minutes. ❑ Inspect pumps (visually check pumps and piping for defects, record amperage readings for each pump). ❑ Clean and inspect floats. ❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS04**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Semi-Annual Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Semi Annual (est. 6 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Thorough inspection and cleaning of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment
❑ Additional Work Orders: **GEN02**

WORK ORDER **LS04**

WORK DESCRIPTION
❑ *Work to be completed by O&M staff or by a certified Lift Station Servicing Contractor* ❑ Record pump hours. ❑ Conduct Generator Maintenance GEN02 ❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS05**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Annual Inspection and Maintenance		
FREQUENCY	Annual (est. 8 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Thorough inspection and cleaning of lift station
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **LS05**

WORK DESCRIPTION

❑ *Work to be completed by O&M staff or by a certified Lift Station Servicing Contractor*
❑ Record pump hours.
❑ Open panel, megger all pumps.
❑ Run all pumps and check their current.
❑ Visually inspect control panel.
❑ Visually inspect pump tank, tank hatches, guide rails and guid rail holders.
❑ Check functionality of check valves.
❑ Visually inspect flush valve, check flush valve oil if necessary, change oil or totally rebuilding flush valve on site if needed.
❑ Re-arrange pump cable and chain if needed for easy removal of pumps.
❑ Pull pumps and ressure wash while still in tank to minimize surface contamination.
❑ Visually inspect pumps, lifting handle, chain, cable, colute face, and the stator and oil chamber plugs for wear.
❑ Replace lifting handle, chain, stator and oil chamber plugs on site if needed.
❑ Check the stator and oil chamber for oil level and water infiltration.
❑ Inspect impeller.
❑ Test run pumps out of tank to listen for noisy bearings, vibrations or abnormal operation and rotation.
❑ Inspect existing zincs or install new ones depending on pump condition.
❑ Lower pumps back into tank.
❑ Test run pumps and check their current. Ensure pumps are pumping down the effluent in the station. Ensure pumps are seated properly.
❑ Inspect float switches, clean off if necessary.
❑ Make sure float switch levels are correct.
❑ Run through float switch cycle if needed.
❑ Replace float switch on site if needed.
❑ Ensure all breakers are on and pump switches are set to auto before leaving.
❑ Ensure all alarms are reset.
❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **LS06**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Collection	**START DATE**	**END DATE**
ASSET COMPONENT	Lift Station		
TASK DESCRIPTION	Pump out and Flush Wet Well - Vac Truck	**RECEIVED BY:**	
FREQUENCY	Annual (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Pump out and Flush Wet Well - Vac Truck
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses, gloves
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS
❑ N/A

WORK ORDER **LS06**

WORK DESCRIPTION
❑ Make arrangements to have a qualified vac truck contractor pump out and flush wet well.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **GEN01**

ASSET		**ORDER DATE**	
ASSET GROUP	OTHER	**PO#**	
ASSET SUBGROUP	Electrical	**START DATE**	**END DATE**
ASSET COMPONENT	Backup Generator		
TASK DESCRIPTION	Monthly Generator Maintenance	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly Generator Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, multimeter
MATERIALS REQUIRED	Coolant and oil as required

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor	1.0		$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **GEN01**

WORK DESCRIPTION
❑ Inspect enclosure. ❑ Check engine coolant level. ❑ Check engine oil level. ❑ Replace fuel as required. ❑ Check the battery charger. ❑ Complete inspection form.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **GEN02**

ASSET		**ORDER DATE**	
ASSET GROUP	OTHER	**PO#**	
ASSET SUBGROUP	Electrical	**START DATE**	**END DATE**
ASSET COMPONENT	Backup Generator		
TASK DESCRIPTION	Generator Servicing	**RECEIVED BY:**	
FREQUENCY	Annual		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Generator servicing with certified technician
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log, Control Panel Keys
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS
❑ N/A

WORK ORDER **GEN02**

WORK DESCRIPTION
❑ Retain a certified generator maintenance technician to preform annual servicing.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W01**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Monthly Distribution System Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 0.3 hr/km of watermain)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly inspection of distribution system
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Valve wrench set, Valve pick
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W01**

WORK DESCRIPTION

- ❑ Walk or drive along all watermain rights-of-way and check for signs of dampness, or accumulation of water or ice, which may indicate leakage.
- ❑ Check that all hydrants and standpipes are straight up and down. Clear any vegetation around them to make them easily visible/accessible.
- ❑ Check that all valve box lids, hydrant caps, and other appurtenances are in place. Set back in place if missing, repair damage.
- ❑ Locate and expose all valve boxes. Open alll valve box lids to ensure they are accessible. Check all main valves and ensure valve stem is vertical. Movement of valves could indicate failure due to fracture or misalignment.
- ❑ Close and open main valves and check for leaks. After operating each valve ensure that it is left in its normal operating position.
- ❑ Record locations of any new main valves and services on as-built drawings and O&M manual
- ❑ Survey the residents to check for leaks, lack of pressure, dirty water, and water taste (chlorine)
- ❑ Note any signs of excessive water usage.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W02**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Valve Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 3.3 labour hrs/km of watermain)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Locate, inspect, and perform maintenance on valves
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Fire Department ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, valve key
MATERIALS REQUIRED	Lubricants and epoxy paint as required

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W02**

WORK DESCRIPTION

- ❑ Notify Administration Office, Campground Office, and Fire Department that water supply will be interrupted. Review all equipment before leaving the yard.
- ❑ Remove valve box top and clean out debris etc. from box, if applicable. Remove sand, etc. from valve and lubricate gears, bolts, etc.
- ❑ Work valve (opening an closing) slowly until confident that valve is closed when shut. All valves close by turning valve stem clockwise. Check for leaks. Check if valve is vertical, movement of valves could indicate possible failure due to fracture or misalignment.
- ❑ Proceed to next valve and repeat above steps to isolate the section of watermain.
- ❑ Check with consumers connected to isolated section to determine if valve is functioning properly (i.e. water is shut off). If water is still available, repeat Steps 3 to 6 until valve is functioning properly. If still unable to operate valve correctly after 3 attempts, contact Engineer and band office.
- ❑ Before leaving a valve fully open, turn clockwise one half turn to prevent the valve from sticking.
- ❑ Proceed to next section (Paint valve boxes with epoxy yellow and mark with stake if required)

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W03**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Watermain Flushing	**RECEIVED BY:**	
FREQUENCY	Annual (est. 8 labor hr/km of watermain)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual Watermain Flushing
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Hydrant wrench / hydrant pump, fire hose
MATERIALS REQUIRED	Lubricants and epoxy paint as required

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W03**

WORK DESCRIPTION

- ❑ Mains are flushed by opening hydrants creating high flows in mains to flush out silt, rust, etc.
- ❑ Notify all affected water users that system is being flushed.
- ❑ Ensure reservoir is full.
- ❑ Start at hydrant closest to where supply main joins distribution system. Attach fire hose and run hose to ditch or sewer manhole to control water. (If hose run into sewer, coordinate with sewer flushing task S02.)
- ❑ Open hydrant fully and flush for 10 minutes or until water runs clear.
- ❑ Slowly close hydrant, grease threads lightly, and replace port caps.
- ❑ Pick up hoses, move to next hydrant downstream, and repeat until all mains are flushed.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W04**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Hydrant Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 4.7 labor hrs/km of watermain)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual inspection and maintenance of fire hydrants
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Fire Department ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Hydrant wrench / hydrant pump, valve key
MATERIALS REQUIRED	Lubricants and epoxy paint as required

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W04**

WORK DESCRIPTION

- ❑ Notify Administration Office, Campground Office, and Fire Department that water supply will be interrupted.
- ❑ With outlet nozzel cap closed, open the hydrant fully until the stem stops turning.
- ❑ If stem action is tight, open and close it a few times until operation is smooth and free.
- ❑ If there is leakage at the joints, packing seals, or nozzels, close hydrant and lubricate, tighten or replace packing, nozzles gaskets, and O rings. (Use jet-lube on operating nut and AP-5 on nozzles. These are lubricants non-destructive to rubber lined fire hose).
- ❑ With the hydrant closed, remove a nozzle cap.
- ❑ Look and listen for water that continues to flow indicating leakage through the main valve, if there is a leak, make a note and arrange for repairs.
- ❑ Open the hydrant and flush out debris for 1 minute. (If a hose is used to redirect the water, then after flushing, close the hydrant, removed hose and re-open hydrant until water flows from nozzle).
- ❑ Remove independent cut-off nozzle cap, where present, fully open and close valve to ensure ease of operation. Lubricate if required and check that there is an unrestricted flow of water through the nozzle.
- ❑ Close the hydrant and check for drainage by putting hand over nozzle and feeling for suction, replace cap only when suction stops. If there is no suction or if water is observed in the barrel, open the hydrant until water discharges from the nozzle. This action should flush the hydrant drain. Shut the hydrant and recheck for suction. Hydrants with blocked or permanently plugged drains should be marked and pumped out after each usage.
- ❑ Clean and lubricate nozzle threads.
- ❑ If any leakages cannot be corrected with tools at hand or if hydrant is inoperable, close auxiliary valve. Inform Fire Department and promptly arrange to have repairs carried out.
- ❑ Check that hydrant is reassembled properly and functional. Paint the hydrants if required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W05**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	PRV		
TASK DESCRIPTION	PRV Inspection (Contractor)	**RECEIVED BY:**	
FREQUENCY	Annual		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual check of Water Meters and PRV
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Meter Box Key
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ N/A

WORK ORDER **W05**

WORK DESCRIPTION
❑ Make arrangements to have a qualified contractor inspect PRV.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W06**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	PRV		
TASK DESCRIPTION	PRV Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Weekly check of Water Meters and PRV
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Meter Box Key
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W06**

WORK DESCRIPTION
❑ Check for leaks from valves and fittings. ❑ Check all valves are turned to open position. ❑ Check operation of PRVs. Compare pressure gauge reading upstream and downstream of pressure reducing valve. Confirm downstream gauge set to system operating pressure.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W07**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Mains		
TASK DESCRIPTION	Winterizing Water System	**RECEIVED BY:**	
FREQUENCY	Twice annually (drain November, reactivate March)	(est. 0.5 labor hr/hydrant)	
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Drain hydrants to winterize water system
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Fire Department ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Hydrant wrench / hydrant pump, valve key
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W07**

WORK DESCRIPTION
❑ Drain hydrants to prevent freezing. Open hydrant to allow flow out port. ❑ Close hydrant valve. ❑ Turn hydrant nut to closed position. ❑ Replace port cap. ❑ Contact fire department to inform them of works done.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W08**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Watermain		
TASK DESCRIPTION	Watermain Spot Repairs	**RECEIVED BY:**	
FREQUENCY	As needed (est. 8 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Watermain Spot Repairs
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Fire Department ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, backhoe, compactor, mud pump, hand tools
MATERIALS REQUIRED	Sand bedding, gravel, repair sleeves, couplings, pipe

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Ergonomics (MSI) Requirements
- ❑ Personal Protective Clothing and Equipment
- ❑ Traffic Control

WORK ORDER **W08**

WORK DESCRIPTION

- ❑ Ensure that the equipment is operative before leaving yard.
- ❑ Obtain BC 1 Call ticket to confirm locations of underground services (oil, propane, power, sewer, watermains and services). Check available plans.
- ❑ Proceed to designated area and set out required safety devices and signs.
- ❑ If there is no flooding of homes, etc., leave main line on and:
- ❑ a. have consumers notified
- ❑ - to store any required water during the interruption
- ❑ - probable duration of water service interruption
- ❑ b. then locate the break in main line pipe by any means necessary (leak detector, drilling holes in pavement, checking for noise on meters and/or curb boxes)
- ❑ c. shut off valves required to isolate main
- ❑ If there is flooding of homes etc., the main line must be shut off immediately. Then proceed through previous steps to notify consumers and isolate break in the main.
- ❑ Notify Administration Office and fire department of number and location of hydrants involved.
- ❑ Notify Administration Office and fire department of required traffic rerouting (streets closing and detours).
- ❑ Excavate.
- ❑ Repair pipe at damaged spot using required repair clamps.
- ❑ Check elevations for local depressions and repair pipe bedding where necessary.
- ❑ Open main line valves. Check new section of pipe and joints for leakage.
- ❑ If leakage is observed, shut off valves to isolate main line and carry out corrective action. Repeat previous step to ensure leakage is resolved.
- ❑ Slowly open hydrants only to remove air, rust, and sand from watermain.
- ❑ Backfill around the pipe and 300mm over the pipe with clean granular material less than 25mm in size. Compact by hand in 150mm lifts to give firm support for the pipe. Ensure that no large rocks come in contact with pipe or repair clamps.
- ❑ Backfill excavation above the pipe zone with native soil in 200mm layers. Compact each layer with compactor.
- ❑ Notify Administration Office and fire department that the watermain and hydrants are back in service.
- ❑ Repair travelled surface as needed, remove equipment and clean up area.
- ❑ Have health unit monitor the chlorine residual and notify the Administration Office when the water has been

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W09**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Curb box/stop		
TASK DESCRIPTION	Curb Box and Curb Stop Repairs	**RECEIVED BY:**	
FREQUENCY	As needed (est. 6 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Curb Box and Curb Stop Repairs
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, backhoe, compressor and blowpipe, tamper, hand tools
MATERIALS REQUIRED	Varies with repair

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W09**

WORK DESCRIPTION

- ❑ Check equipment before leaving yard to ensure it is in working condition.
- ❑ Proceed to designated area and set out required safety devices and signs.
- ❑ Blow out curb box with compressor. Note: If curb box requires repair proceed as follows:
- ❑ Obtain location of utilities from telephone, gas, and hydro companies if required.
- ❑ Remove sod as required, and excavate and expose curb box foot and curb stop.
- ❑ Check condition and carry out necessary repairs.
- ❑ Backfill excavation with native soil, compact with tamper in 300mm lifts to grade.
- ❑ Repair surface to original, remove equipment, and clean up area.
- ❑ As required: locate, mark, and paint each house connection to curb stop valve box.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W10**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Fire Hydrant and Standpipe		
TASK DESCRIPTION	Fire Hydrant and Standpipe Test	**RECEIVED BY:**	
FREQUENCY	3 times per year (every 3 months except in winter)	(est. 2 labor hrs/hydrant)	
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Fire Hydrant and Standpipe Test
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Hydrant wrench / hydrant pump, valve key
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W10**

WORK DESCRIPTION

- ❑ Test the operation and condition of each hydrant.
- ❑ Locate and open the valve to the main. Adjust the valve box to a level slightly above the adjacent ground or 150mm below grade in travelled roadway. Paint the valve box with yellow epoxy.
- ❑ Check the standpipes for water tightness, listen to the valve key for the sound of running water indicating underground leakage. If leakage is detected or suspected, schedule standpipe for repair.
- ❑ Check hydrant for completeness of cap. Replace if necessary.
- ❑ Attach fire hose to hydrant (standpipe) and run to nearest ditch.
- ❑ Locate open 150L drum adjacent to ditch.
- ❑ Slowly open hydrant valve directing fire hose into ditch. Ensure air gap is maintained between nozzle and any part of manhole to prevent contamination of nozzle. On completion treat nozzle liberally with bleach to disinfect.
- ❑ Direct hose discharge into empty 150L barrel, and record in seconds the time required to fill the barrel.
- ❑ A. 150L in _____sec = _____L/s
- ❑ B. 150L in _____sec = _____L/s
- ❑ C. 150L in _____sec = _____L/s

- ❑ Note size of fire hose and nozzle hose diameter
- ❑ Hose diameter _____mm
- ❑ Nozzle diameter_____mm
- ❑ Distance from standpipe to nozzle _____m
- ❑ Direct fire flow stream to its maximum horizontal distance to an area that is level with the operator. Measure the maximum distance travelled by the fire stream.
- ❑ Horizontal drop _____m
- ❑ A. Maximum distance _____m
- ❑ B. Maximum distance _____m
- ❑ C. Maximum distance _____m
- ❑ Allow fire stream into the ditch for a five minute period, taking care to prevent contamination of the nozzle.
- ❑ Close hydrant slowly. Wait five minutes for hydrant body to drain before replacing cap. Test to ensure hydrant has drained. If hydrant does not drain, note for repair.
- ❑ Empty test barrel, replace manhole cover, and grease.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W11**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Valve		
TASK DESCRIPTION	Valve Repair	**RECEIVED BY:**	
FREQUENCY	As required (est. 8 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Valve Repair
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Fire Department ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, valve key, backhoe, compactor, mud pump, misc. hand tools
MATERIALS REQUIRED	Valves, repair clamps, sand bedding

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W11**

WORK DESCRIPTION

- ❑ Check equipment before leaving yard.
- ❑ Obtain location of sewer and water lines and connections.
- ❑ Notify Administration Office and fire department of water service interruption.
- ❑ Excavate and remove extra fill, expose valve, and check condition.
- ❑ Shut off appropriate valves.
- ❑ Remove bonnet, spindle, and gates. Check condition.
- ❑ Cut out obsolete valve if it cannot be repaired on site. Install new valve of required size with MOA pipe and repair clamps.
- ❑ Re-open main valves and check for leaks. If leakage exists, shut off valves and make repairs as necessary. Repeat to confirm leakage is resolved.
- ❑ Blow out designated hydrants and pump out.
- ❑ Place 450mm of granular material as bedding for the valve. Backfill excavation with native soil 200mm layers and compact each layer with tamper.
- ❑ Repair surface as necessary and clean up area.
- ❑ Notify Administration Office, consumers, and fire department that work is complete.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W12**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Hydrant		
TASK DESCRIPTION	Hydrant Repair (General)	**RECEIVED BY:**	
FREQUENCY	As required (est. 8 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Hydrant Repair (General)
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Fire Department ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, backhoe, compactor, mud pump, hand tools
MATERIALS REQUIRED	Varies by repair

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W12**

WORK DESCRIPTION

- ❑ Check equipment before leaving yard.
- ❑ Notify Administration Office, consumers, and fire department of water service interruption.
- ❑ Shut off necessary main valves.
- ❑ Excavate to expose hydrant lead and carry out necessary repairs.
- ❑ Open main valves and check for leakage. If leakage is observed, close main valves and carry out required repairs. Repeat until no leakage is observed.
- ❑ Backfill excavation with native soil in 200mm layers and compact each layer with a compactor. Repair surface and clean up area.
- ❑ Notify Administration Office and fire department of work completion.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W13**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Hydrant		
TASK DESCRIPTION	Hydrant Repairs (Internal)	**RECEIVED BY:**	
FREQUENCY	As required (est. 8 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Hydrant Repairs (Internal)
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Fire Department ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, hydrant wrench, hand tools
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W13**

WORK DESCRIPTION
❑ Check equipment before leaving yard. ❑ Contact Administration Office and notify fire department of number and location of hydrants not in service. ❑ Shut off hydrant auxiliary valve, remove bonnet. ❑ Open hydrant auxiliary valve and pump out hydrant to test proper functioning. ❑ If hydrant operates correctly, proceed to next designated hydrant. If not, repeat steps until it is working correctly.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W14**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Hydrant		
TASK DESCRIPTION	Hydrant Painting	**RECEIVED BY:**	
FREQUENCY	Every 3 years (est. 0.5 labour hr/hydrant)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Hydrant Painting
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, paint brushes, rags, number stencils
MATERIALS REQUIRED	Paint

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **W14**

WORK DESCRIPTION
❑ Paint fire hydrants fire red. ❑ After paint has dried (next day), paint yellow identification numbers on hydrants.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W15**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Air Release Valve Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Semi-Annual (est. 1 labor hr/valve)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Semi-annual inspection of air release valves
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment
❑ Confined Space

WORK ORDER **W15**

WORK DESCRIPTION
❑ Carry out an inspection to verify operation of each Air Release Valve ❑ Check unit and pipe connections for any leakage. ❑ With the inlet shut-off valve open, partially open the drain valve until flow can be heard. If the air release valve is working properly, water should be exhausted from the drain valve. If a large amount of air is exhausted, valve requires backwash procedure and/or service. ❑ Contract certified service technicians to trouble-shoot the cause and rectify.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W16**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Chlorine Residual Test	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Chlorine Residual Test
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE (gloves and safety glasses), Maintenance Truck, chlorine residual test kit
MATERIALS REQUIRED	Chlorine test chemicals

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **W16**

WORK DESCRIPTION
❑ Choose four residential test locations ❑ Turn on a cold water faucet and let the water run about one minute or until fresh. ❑ Take a water sample, following the instructions supplied with the test kit. ❑ File correspondence and, if necessary, take medial measures such as increasing or decreasing chlorine dosing concentrations. Typically, residual chlorine readings should not be less than 0.1 mg/L at any location within the distribution system.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W17**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Water Quality Check	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Water Quality Check
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck
MATERIALS REQUIRED	Sample bottles provided by Health Canada

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **W17**

WORK DESCRIPTION
❑ Turn on a cold water faucet and let the water run about one minute or until fresh. ❑ Take a water sample, following the instructions supplied with the sample bottle. ❑ Ship the sample container in a cooler box to Health Department as soon as possible after sampling. ❑ File correspondence and, if necessary, take medial measures such as increasing chlorine dosing concentrations, cleaning reservoir, or flushing pipes.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W18**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Watering Points Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Watering Points Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, wrenches
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **W18**

WORK DESCRIPTION
❑ Check all watering points to make sure taps and lines are not leaking or frozen. Repair or remove ice as required. ❑ Report any major problems to Administration Office (frozen or broken water lines) ❑ Check caps

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **W19**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply / Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Main		
TASK DESCRIPTION	Air Release Valve Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 2 labor hrs/valve)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual inspection of air release valves
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment
❑ Confined Space

WORK ORDER **W19**

WORK DESCRIPTION
❑ Contract certified service technicians shall carry out a complete inspection and service of each Air Release Valve ❑ Air Release Valve Chamber is a confined space - do not enter without appropriate training, procedures, and equipment.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT01**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Chlorine Disinfection Treatment System		
TASK DESCRIPTION	Daily Inspection	**RECEIVED BY:**	
FREQUENCY	Daily (est. 0.5 labor hrs/station)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Daily inspection of Chlorine Disinfection Treatment System (check all stations)
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT01**

WORK DESCRIPTION

- ❑ Visually/audibly inspect the treatment plan and surrounding area. Check for signs of damage/vandalism.
- ❑ Check solution level in the tank: refill if necessary and be sure to replace the cover. (Ensure chlorine mixing procedure is posted in treatment building.)
- ❑ Visibly mark solution tank
- ❑ Check for excessive chlorine odor or visible leaks. Repair leaks if required. Ensure adequate ventilation.
- ❑ Check pump for unusual warmth or vibration that could indicate damaged bearings or gears.
- ❑ Test free chorine residual in distribution system using an EPA approved test kit.
- ❑ Evaluate and log results - note consistency of free chlorine levels in log book.
- ❑ Adjust pump feed-rate control as required.
- ❑ Record results of all tests, chemical use, water production, and maintenance in daily logbook.
- ❑ Check records of logbooks for unusual data, trends and other indicators or possible problems.
- ❑ Keep copy of chlorination treatment system O&M manual in treatment building.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT02**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Chlorine Disinfection Treatment System		
TASK DESCRIPTION	Quarterly Inspection	**RECEIVED BY:**	
FREQUENCY	Quarterly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Quarterly inspection and Maintenance of Chlorine Disinfection Treatment System
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Calibration tools, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
  - ❑ Working Alone or in Isolation
  - ❑ Ergonomics (MSI) Requirements
  - ❑ Personal Protective Clothing and Equipment
- ❑ Manufacturer's Instructions

WORK ORDER **WT02**

WORK DESCRIPTION
❑ Calibrate chemical feed pump to verify the performance of the pump output - follow manufacturer's instructions ❑ Wash and clean the chlorine solution tank if there is any sediment build-up. Clean the chlorinator, lines and foot valve as needed - follow manufacturer's instructions.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT03**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Chlorine Disinfection Treatment System		
TASK DESCRIPTION	Annual Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 4 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual inspection and Maintenance of Chlorinator
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, back-up chemical feed pump, Inspection Log
MATERIALS REQUIRED	Spare Parts Kit (o-rings, valves)

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ Manufacturer's Instructions

WORK ORDER **WT03**

WORK DESCRIPTION
❑ Clean the chlorinator and replace the O-rings, valves, and worn or damaged parts - use the spare parts kit to make repairs and follow manufacturer's instructions. You should have a back-up chemical feed pump to provide continuous disinfection.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT04**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Daily Inspection	**RECEIVED BY:**	
FREQUENCY	Daily (7 days/week) (est. 0.5 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Daily Inspection (7 Days per Week)
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT04**

WORK DESCRIPTION
❑ Record turbidity, colour, and chlorine residual ❑ Adjust chlorine feed rate if necessary

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT05**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Week Day Inspection	**RECEIVED BY:**	
FREQUENCY	Weekdays (5 days/week) (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Water Treatment Plant Week Day Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT05**

WORK DESCRIPTION

- ❑ Record raw water flowmeter reading
- ❑ Record 24 hour production for filters from flowmeter
- ❑ Record filter flow rates
- ❑ Record treated water flow
- ❑ Record raw and filtered water turbidity
- ❑ Record raw and filtered water colour
- ❑ Record raw water temperature
- ❑ Record chlorine usage and residual
- ❑ Adjust chlorine feed rate if necessary
- ❑ Record piezometer levels for filter headloss
- ❑ Adjust filter production rate in PLC if necessary
- ❑ Inspect water treatment facility

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT06**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Periodic Inspection and Test	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Water Treatment Plant Periodic Inspection and Test
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT06**

WORK DESCRIPTION
❑ Conduct periodic jar tests to optimize alum dosage and adjust alum feed pump accordingly ❑ Once per week measure pH, alkalinity, and hardness of trated water

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT07**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Filter Scraping	**RECEIVED BY:**	
FREQUENCY	6 times/year (est. 16 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Filter Scraping
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, shovels, wheelbarrow
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT07**

WORK DESCRIPTION

- ❑ NOTE: All equipment should be clean and shovels, boots, and wheelbarrows should be dedicated solely for this task to avoid possible contamination of the filters.
- ❑ Shut off inflow to filter to be scraped
- ❑ Decant unfiltered water to just above sand surface by opening filter draw down valve to drain
- ❑ Lower water to 30cm below filter sand surface using underdrain valve
- ❑ Lay 25mm x 250mm planks across filter sand for working surface; do not walk on unscraped filter sand
- ❑ Remove top 1 to 2cm of sand using square headed shovel and wheelbarrow and discard
- ❑ Rake sand level
- ❑ Slowly refill filter by backfeeding from bottom through underdrain with filtered water from active filter to just above sand
- ❑ Fill filter part way up with unfiltered water input through draw down line
- ❑ Fill and run filter using raw water inlet line
- ❑ Waste filtered water until good quality water is being produced

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WT08**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Water Treatment Plant		
TASK DESCRIPTION	Media Addition	**RECEIVED BY:**	
FREQUENCY	Every 6 years (est. 60 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Water Treatment Plant Media Addition
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, bobcat
MATERIALS REQUIRED	Sand

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **WT08**

WORK DESCRIPTION
❑ Follow WT07 for scraping filter ❑ After scraping filter, further drain underdrain piping by opening filter drain valve to waste (if necessary for inspection of underdrains etc.) ❑ Resand filter and spread evenly ❑ Follow procedure in WT07 for refilling filter after scraping

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WW01**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Groundwater Well		
TASK DESCRIPTION	Weekly Maintenance	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Weekly or daily groundwater well inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Enclosure Keys, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WW01**

WORK DESCRIPTION
❑ Check well house interior (if applicable) and grounds for general cleanliness and condition, and for any threats to water quality ❑ Check any warning lights or alarms - low water level in the well, intrusion, power outage, pump failure, and so on. ❑ Read source water meter. Record water-production data in well house log. ❑ Check pump-cycling rate. If it runs continuously or cycles more than 6 times per hour, see pump troubleshooting. ❑ Check well house building or fenced enclosure for signs of security problems - graffiti, vandalism, doors or locks damaged etc. ❑ Check wells source site after any adverse weather - high winds, heavy snow, ice, rains, etc.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WW02**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Groundwater Well		
TASK DESCRIPTION	Monthly Maintenance	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly groundwater well inspection and maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WW02**

WORK DESCRIPTION

- ❑ Check well water level if source capacity is marginal or there are drought conditions.
- ❑ Check area for excessive vegetation or dangerous conditions - uncut grass, brush, dead trees, fire hazard, etc.
- ❑ Check well house control valves for proper positions, open or closed. Post information.
- ❑ Check source control system - pressure switch settings, cycling, pressure tanks, storage tank water levels, etc.
- ❑ Check well house control valves for damage or leaks.
- ❑ Check for leaks - read source meter when you expect the water usage to be zero.
- ❑ Check source pump cycling and pressure switch settings, on/off pressures and line pressures.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WW03**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Groundwater Well		
TASK DESCRIPTION	Annual Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 3 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual groundwater well inspection and maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Tools for exercising valves, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WW03**

WORK DESCRIPTION

- ❑ Check well site for water ponding, poor drainage areas, excessive vegetation, unhealthy trees, fire hazards, etc.
- ❑ Check source facilities conditions - corrosion, vent screens, vehicular or other damage, animal activity, etc.
- ❑ Check cold weather protection - insulation, heating system, alarm system etc.
- ❑ Verify sanitary integrity of the sources - screened vents, no unprotected openings, electrical box sealed.
- ❑ Evaluate source using designations (permanent, seasonal, emergency, inactive)
- ❑ Exercise valves and test run emergency source wells to waste. Do not supply distribution system without WQ tests.
- ❑ Evaluate Emergency Response Plan and update as required.
- ❑ Review source related customer complaints and evaluate corrective actions and planning.
- ❑ Implement seasonal start-up or shut-down procedures as required.
- ❑ Review source water quality test results for trends, such as increasing nitrate or seasonal coliform problems.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WW04**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Groundwater Well		
TASK DESCRIPTION	Periodic Maintenance	**RECEIVED BY:**	
FREQUENCY	Every 3 years (est. 4 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Periodic well assessment
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WW04**

WORK DESCRIPTION
❑ Measure source pump capacity in gallons per minute (GPM) to detect pump output problems. ❑ Evaluate general source capacity to meet water system demand. Use water use and production records. ❑ Evaluate capacity of source water to provide water of a reliable quantity and quality acceptable to customers. ❑ Consider television inspection of the well interior and the well screens ❑ If the source capacity is marginal or drought conditions are present, develop and implement a Conservation Plan.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **BS01**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Boost Station		
TASK DESCRIPTION	Weekly Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Weekly or daily boost station inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, temperature gage, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **BS01**

WORK DESCRIPTION

- ❑ Check pump house interior and grounds for general cleanliness and condition.
- ❑ Check any warning lights or alarms for low pressure, pump failure, intrusion, power outage.
- ❑ Check pumps for leaks or seepage for pumps that are not water lubricated.
- ❑ Check motor for unusual pump motor conditions such as:
  - ❑ Unusual pump noises in operation (hum, chattering, clicking, rapid knocking)
  - ❑ Motor fails to start or to come up to speed normally
  - ❑ Blackened or excessive sparking at communtator or brushes
  - ❑ Fine dust under couplings with rubber butters or pins
  - ❑ Smoke or charred insulation
  - ❑ Excessive vibration
- ❑ Check pump cycle rate - troubleshoot excessive pump cycling (about 6 cycles per hour)
- ❑ Verify start and stop pressure settings and operability of water pressure gauges - reference O&M manual.
- ❑ Check bearing temperatures - if a temperature gauge is available. Take care when checking how hot it may be.
- ❑ Check and record pump run hours.
- ❑ Check condition of the pump house and booster pump stations for damage and deterioration.
- ❑ Check area around the pump house and booster station for security concerns, vandalism or unauthorized access.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **BS02**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Boost Station		
TASK DESCRIPTION	Monthly Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 4 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly Booster station inspection and maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ Additional Work Orders: **GEN01**

WORK ORDER **BS02**

WORK DESCRIPTION

- ❑ Check oil or grease lubricant reservoirs for proper levels and any leakage or unusual conditions.
- ❑ Measure the pump capacity, compare with the expected output - from performace records or design parameter.
- ❑ Perform routine operation of emergency generator per manufacturer's instructions - check condition of emergency gneerator batteries, fuel levels, oil levels, instruments and controls. SEE GEN01
- ❑ Check that the existing pressure gauges pump run meters and flow meters are functioning properly.
- ❑ Check that pump controls are functioning properly
- ❑ Check pump house lighting, ventilation, heating, and animal proofing (birds, bats, rodents)

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **BS03**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Distribution	**START DATE**	**END DATE**
ASSET COMPONENT	Boost Station		
TASK DESCRIPTION	Annual Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 6 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual Boost Station Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, O&M Manual, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **BS03**

WORK DESCRIPTION

- ❑ Evaluate the working condition of all pumps and schedule maintenance, overhaul, or replace.
- ❑ Review emergency response plans and update as needed.
- ❑ Review O&M manual and update as necessary
- ❑ Review the adequacy, reliability and redundancy of the current pumping facilities and plan for improvements.
- ❑ Review financial capacity to complete expected maintenance or replacement to existing pumping facilities.
- ❑ Measure source pump capacity in gallons per minute (GPM) to detect pump output problems.
- ❑ Evaluate the design of existing pump facilities and plan for improvements.
- ❑ Verify pressure gagues are available to monitor pump capacity.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS01**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Weekly Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Daily or Weekly Inspection of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS01**

WORK DESCRIPTION

- ❑ Check any warning lights or alarms - low water level, hight water level, intrusion, power outage, and so on.
- ❑ Check storage tank for signs of security breaches - damaged fences, open gates, graffiti, vandalism, etc.
- ❑ Check water level indicator - functioning, adequate amount of stored water, excessive water use.
- ❑ Check the overflow line, vents, ladder access locks, roof access hatches, and controls that are readily visible from the ground for damage, vandalism, or other conditions.
- ❑ Check storage tank and site after any adverse weather - high winds, heavy snow, ice, rains, etc.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS02**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Monthly Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 3 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly Inspection and maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS02**

WORK DESCRIPTION
❑ Check water level indicator ❑ Verify all openings are protected from surface runoff, windblown contaminants, insects, birds and animals. ❑ Check tank overflow lines for signs of damage, such as, screens, flapper valves, check valves, splash plate, etc. ❑ Check area for excessive vegetation or dangerous conditions - uncut grass, brush, dead trees, fire hazard, etc. ❑ Check control valves for proper positions, open or closed ❑ Check control valves for damage or leaks. ❑ Check low water temperature alarm - cold weather only. ❑ Check high water temperature limit switch - when heating system in service.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS03**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Quarterly Inspection	**RECEIVED BY:**	
FREQUENCY	Quarterly (est. 3 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Quarterly Inspection and maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS03**

WORK DESCRIPTION

- ❑ Check water level indicator
- ❑ Visually inspect tank exterior and roof for signs of damage, corrosion, degradation, leakage or structural problems, with particular focus on all openings into the reservoir (reservoir roof and sidewall vents access hatch, overflow outlet, and so on.)
- ❑ Check tank-supporting structure for signs of damage, corrosion, degradation, structural inadequacy.
- ❑ Tank catwalks/ladders free from signs of damage, corrosion, degradation, structural condition, vandalism, etc.
- ❑ Tank area for water ponding, poor drainage areas, excessive vegetation, unhealthy trees, fire hazards, etc.
- ❑ Tank area free from combustible storage, trash, debris, brush, or other material that could present a fire hazard.
- ❑ Tank area free of accumulation of material on or near parts possibly resulting in accelerated corrosion or rot.
- ❑ Tank and support free of ice buildup.
- ❑ Check earth embankments for erosion, burrowing animals, improper drainage and leakage.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS04**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Annual Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 4 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual Inspection and maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Tools for exercising valves, Inventory, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Ergonomics (MSI) Requirements
- ❑ Personal Protective Clothing and Equipment

WORK ORDER **WS04**

WORK DESCRIPTION
❑ Check storage tank structural, seismic and sanitary integrity - leaks, corrosion, cracks, supports, warping, etc. ❑ Inspect storage tank interior for pitting, concrete spalling, rot, corrosion, rust, water level sensors, biofilm build-up etc. ❑ Exercise valves and make repairs as needed. ❑ Inventory and evaluate storage facilities capacity, condition, replacement costs and plan for improvements. ❑ Evaluate stored water for clarity, sediments, floating materials or films, unusual odors, insects birds or animals. ❑ Plan for storage facility improvements and budget for the associated costs.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **WS05**

ASSET		**ORDER DATE**	
ASSET GROUP	WATER	**PO#**	
ASSET SUBGROUP	Supply	**START DATE**	**END DATE**
ASSET COMPONENT	Water Storage		
TASK DESCRIPTION	Three Year Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Every 3 Years (est. 8 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Three to Five Year Inspection and Maintenance of Water Storage Facility
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Maintenance Truck, Inspection Log
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **WS05**

WORK DESCRIPTION

- ❑ Tank indicator inspected - every three years for steel storage tanks without corrosion protection
- ❑ Tank indicator inspected - every five years for storage tanks other than steel without corrosion protection
- ❑ Drain, inspect, clean, and disinfect storage tank or use a diving maintenance service without draining tank.
- ❑ Respond to any evidence of storage tank problems.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST01**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Bi-Annual Lagoon Inspection	**RECEIVED BY:**	
FREQUENCY	Bi-Annual (est. 3 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Bi-Annual Lagoon Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST01**

WORK DESCRIPTION

- ❑ Visually inspect effluent pump, alarms and controls to ensure they are in adequate operating condition as per SMP section 3.7.7.5
- ❑ Test alarm operation including a physical test with a float
- ❑ Check all plumbing fittings and ensure piping is in operating condition
- ❑ Measure and record water level in lagoon below berm top
- ❑ Visually inspect fencing
- ❑ Maintain vegetation as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST02**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon Facility		
TASK DESCRIPTION	Monthly Lagoon Facility Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 1.5 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly Lagoon Facility Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Ergonomics (MSI) Requirements
- ❑ Personal Protective Clothing and Equipment

WORK ORDER **ST02**

WORK DESCRIPTION
❑ Ensure vegetation shall be maintained at a height not more than 6" above the ground on lagoon dykes ❑ Not more than 10% of the water surface shall be covered by floating vegetation and not more than 10% of the water perimeter may have emergent rooted aquatic plants. ❑ Inspect for dike damage caused by erosion or animal burrowing and correct immediately ❑ Inspect integrity of the lagoon liner, correct immediately if deficiencies noted.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST03**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Septic Tank / Field (Type 1)		
TASK DESCRIPTION	Septic Tank Pumping	**RECEIVED BY:**	
FREQUENCY	As Required (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Septic Tank Pumping
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST03**

WORK DESCRIPTION

- ❑ Retain certified septic tank pumping company to pump tanks as required.
- ❑ Ensure that tanks pumped during winter conditions are refilled immediately and that all plastic tanks are refilled immediately.
- ❑ Pumping out of the tank should be shceduled at the most fabourable time of the year in terms of freezing temperatures and groundwater.
- ❑ Some digestion of sludge and reduction of sludge volume occurs after approximately 3 years, it is therefore not appropirate to pump out tanks when pumping is not required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST04**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Septic Tank / Field (Type 1)		
TASK DESCRIPTION	Monthly Septic Tank and Field Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Quarterly Septic Tank and Field Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST04**

WORK DESCRIPTION

- ❑ Visually inspect for sludge and scum accumulations. Inspect for clogging, damage, and proper placement of outlet baffle and filter. Clean filter and replace if damaged or deteriorating.
- ❑ Record signs of leaking or infiltration in tanks, penetrations, and risers. Repair or replace as necessary.
- ❑ Look for signs of overflow/seepage probelms
- ❑ Ensure risers and lids are above grade with secure lids, and surface water is directed away from lids.
- ❑ Ensure floats are functioning properly. Check that float actuates alarm when moved to "on" position. Clean and repair as necessary.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST05**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Septic Tank / Field (Type 1)		
TASK DESCRIPTION	Bi-Annual Septic Tank and Field Inspection	**RECEIVED BY:**	
FREQUENCY	Bi-Annual (est. 3 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Bi-Annual Septic Tank and Field Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST05**

WORK DESCRIPTION

- ❑ Visually inspect for sludge and scum accumulations. Pump when sludge and scum thickness total 1/3 of the depth of the tank or as directed in the maintenance plan.
- ❑ Inspect for clogging, damage, and proper placement of outlet baffle and filter. Clean filter and replace if damaged or deteriorating.
- ❑ Record signs of leaking or infiltration in tanks, penetrations, and risers. Repair or replace as necessary.
- ❑ Look for signs of overflow/seepage probelms
- ❑ Ensure risers and lids are above grade with secure lids, and surface water is directed away from lids.
- ❑ Ensure floats are functioning properly. Check that float actuates alarm when moved to "on" position. Clean and repair as necessary.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST06**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Effluent pump station, RBC Module, secondary clarifiers, chlorination equipment, dechlorinator		
TASK DESCRIPTION	Sewage Treatment Plant Inspection	**RECEIVED BY:**	
FREQUENCY	Daily (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Sewage Treatment Plant Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	Chlorine tablets, sodium thiosulphate

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST06**

WORK DESCRIPTION
❑ Check that all components are secure and that there is no sign of vandalism. ❑ Check that all switches on the control panel are in their proper operating position. ❑ Check that all components are operating. ❑ Check for signs of leakage. ❑ Check chlorinator. Add chlorine tablets when required. Ensure that tablets lie flat. ❑ Check sodium thiosulphate level. Replenish when required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST07**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Effluent pumps, chamber		
TASK DESCRIPTION	Effluent Pump Station Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.5 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Effluent Pump Station Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST07**

WORK DESCRIPTION

- ❑ Inspect system to ensure that pumps are cycling properly in automatic mode.
- ❑ Record pump hours for each pump.
- ❑ Ensure that the float switches are hanging freely and are clear of debris.
- ❑ Simulate pump operations by raising floats to ensure proper operation.
- ❑ Remove any obstacles which may cause blockage of pumps.
- ❑ NOTE: Pumps should be serviced annually by a qualified Contractor.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST08**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Effluent pump chamber, overflow return line		
TASK DESCRIPTION	Effluent Pump Station Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Effluent Pump Station Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, hose
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST08**

WORK DESCRIPTION
❑ Carry out weekly inspection (ST08). ❑ Flush out overflow return line. ❑ Hose down interior of chamber. ❑ NOTE: Shut down RBC drive if flushing from RBC bucket chamber.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST09**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	RBC Unit		
TASK DESCRIPTION	RBC Module Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	RBC Module Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, grease gun, misc. hand tools
MATERIALS REQUIRED	Lubricant, oil

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment
❑ Manufacturer's Instructions

WORK ORDER **ST09**

WORK DESCRIPTION

- ❑ Check to ensure that sludge is not accumulating in the RBC chamber.
- ❑ If sludge has accumulated, schedule pump out at time of septic tank pump out.
- ❑ Do not wash down RBC discs.
- ❑ Check chain drive oil bath, replenish as required.
- ❑ Every three (3) months the roller bearing must be greased. Refer to manufacturer's brochures for information.
- ❑ NOTE: any major servicing required should be carried out by a qualified Contractor. Shut down RBC drive prior to carrying out any servicing.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST10**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Secondary clarifiers, sludge return pumps, pipe		
TASK DESCRIPTION	Secondary Clarifiers Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Daily (est. 0.5 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Secondary Clarifiers Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, squeegee
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST10**

WORK DESCRIPTION

- ❑ Monitor sludge accumulation and adjust frequency of sludge return pump operation as necessary.
- ❑ Gently brush any sludge from walls of chamber to bottom.
- ❑ Skim and dispose of any scum floating on surface or accumulated against baffle.
- ❑ Check air vacuum valve for free operation and flush with clean water as required.
- ❑ NOTE: No adjustment of pumps during inspection and maintenance is required. Once per year thet pumps should be serviced by a qualified Contractor.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST11**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Chlorinators, chlorine contact tank		
TASK DESCRIPTION	Chlorinators and Tank Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Chlorinators and Tank Inspection		
TYPICAL OPERATING CONDITION			
COMMUNICATIONS REQUIRED	❑ Inform Homeowners	❑ Inform Agencies	❑ Inform Staff
EQUIPMENT REQUIRED	PPE, chlorine test kit		
MATERIALS REQUIRED	Chlorine tablets		

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST11**

WORK DESCRIPTION

- ❑ Carry out daily tasks.
- ❑ Monitor chlorine residual at outlet from contact chamber and adjust number of tubes in use as appropriate.
- ❑ Check that nothing is floating in the tank.
- ❑ Check quantity of chlorine tablets and reorder as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST12**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Chlorinators, chlorine contact tank		
TASK DESCRIPTION	Chlorinators and Tank Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Annual (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Chlorinators and Tank Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	Chlorine

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST12**

WORK DESCRIPTION

- ❑ Drain chlorine contact tank.
- ❑ Rinse baffles and walls and flush out any solids which have settled.
- ❑ Inspect baffles for any sign of damage.
- ❑ Refill tank.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST13**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Dechlorination vat and pump		
TASK DESCRIPTION	Dechlorinator Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Dechlorinator Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, chlorine test kit
MATERIALS REQUIRED	Sodium thiosulphate

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST13**

WORK DESCRIPTION
❑ Carry out daily tasks. ❑ Check pump to ensure that pump operates when flow passes through works. ❑ Test effluent to ensure that chlorine residual is neutralized and adjust dechlorination pump as necessary. ❑ Check quantity of sodium thiosulphate and reorder as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST14**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Flow Recorder		
TASK DESCRIPTION	Flow Recorder Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.5 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Flow Recorder Inspection		
TYPICAL OPERATING CONDITION			
COMMUNICATIONS REQUIRED	❑ Inform Homeowners	❑ Inform Agencies	❑ Inform Staff
EQUIPMENT REQUIRED	PPE		
MATERIALS REQUIRED	Flow recording strip		

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

- ❑ Worksafe/Occupational Health & Safety Regulations:
- ❑ Working Alone or in Isolation
- ❑ Personal Protective Clothing and Equipment
- ❑ **Wastewater Systems Effluent Regulations** [https://www.gazette.gc.ca/rp-pr/p2/2012/2012-07-18/html/sor-dors139-eng.html]

WORK ORDER **ST14**

WORK DESCRIPTION

- ❑ Replace flow recording strip as required (once every 30 days)
- ❑ Check recorder float to ensure free operation of mechanism.
- ❑ Replace pen as required.
- ❑ Record date and total flow.
- ❑ Calibrate flow recorder if required. As per Wastewater Systems Effluent Regulations, monitoring equipment must be calibrated at least once in every calendar year.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST15**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Outfall pipe		
TASK DESCRIPTION	Outfall Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Outfall Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST15**

WORK DESCRIPTION
❑ Check and make sure that sewage is not backing up due to a blockage in the line. ❑ During low tides check that the pipe has not been damaged. ❑ Collect sample of effluent and send for testing as required by Wastewater Systems Effluent Regulations. ❑ Any required maintenance should be carried out by a qualified Contractor.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST16**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Flume Chamber		
TASK DESCRIPTION	Flume Chamber & Sewage Flow Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Bi-Weekly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Flume Chamber & Sewage Flow Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST16**

WORK DESCRIPTION

- ❑ Flume Chamber is a confined space - do not enter
- ❑ Open cover and ventilate, as required
- ❑ Note condition of structure including benching and channel
- ❑ Check parshall flume insert for blockages and misalgnment.
- ❑ Note any material build-up in channel causing restriction to flow. Clean as required
- ❑ Check cutrasonic level unit for grease build-up. Wipe off grease with rag, as required
- ❑ Replace chamber cover.
- ❑ Yearly - hose down chamber, benching, channel and fittings.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST17**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Sanitary Treatment - Influent Screen		
TASK DESCRIPTION	Monthly Influent Screen Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly inspection of influent screen
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety Glasses, wrench set
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST17**

WORK DESCRIPTION
❑ Inspect screen for wear and tear. ❑ Inspect fasteners.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST18**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Sanitary Treatment- Spray Pump		
TASK DESCRIPTION	Monthly Spray Pump Inspection	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly inspection of spray pump		
TYPICAL OPERATING CONDITION			
COMMUNICATIONS REQUIRED	❑ Inform Homeowners	❑ Inform Agencies	❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses		
MATERIALS REQUIRED			

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST18**

WORK DESCRIPTION
❑ Check packing on pump and adjust to 5 drops per minute.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST19**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Sanitary Treatment - Dosing Pump		
TASK DESCRIPTION	Chemical Dosing Pump Maintenance	**RECEIVED BY:**	
FREQUENCY	Quarterly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Quarter annual cleaning of chemical dosing pump foot valve and injection tube
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses, gloves
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST19**

WORK DESCRIPTION

❑ *Work to be completed only by Trained and Qualified Personnel*
❑ Isolate dosing pump and flush pump.
❑ Clean foot valve and valve boxes.
❑ Clean injection tube.
❑ Return pump to service.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST20**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Flocculator Tank		
TASK DESCRIPTION	Semi-annual Flocculator Tank maintenance	**RECEIVED BY:**	
FREQUENCY	Semi Annual (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Semi annual inspection and cleaing of flocculator tank
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses
MATERIALS REQUIRED	Tank touch up paint

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST20**

WORK DESCRIPTION

❑ *Work to be completed only by Trained and Qualified Personnel*
❑ Isolate tank.
❑ Drain and clean tank.
❑ Inspect tank and tank coating.
❑ If coating is marked up, touch up paint is required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST21**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Sanitary Treatment - Filter		
TASK DESCRIPTION	Semi-annual filter maintenance	**RECEIVED BY:**	
FREQUENCY	Semi Annual (est. 1.5 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Semi annual inspection and cleaing of lift station filter
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses, gloves
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST21**

WORK DESCRIPTION
❑ *Work to be completed only by Trained and Qualified Personnel* ❑ Check valve seals for leakage. Replace as needed. ❑ Check pressure guage condition. Replace as needed.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST22**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Sanitary Treatment - Dosing Pump		
TASK DESCRIPTION	Semi-annual Chemical Dosing Pump Maintenance	**RECEIVED BY:**	
FREQUENCY	Semi Annual (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Semi annual inspection and cleaing of chemical dosing pump
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses, gloves
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Working Alone or in Isolation
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST22**

WORK DESCRIPTION
❑ *Work to be completed only by Trained and Qualified Personnel* ❑ Check pump output at varying pump speeds (100%, 75%, 50%, and 25%). ❑ Verify that the pump output volume is consistant with manufactures specifications.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST23**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Annual Rock Filter Inspection	**RECEIVED BY:**	
FREQUENCY	Annual (est. 8 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Annual Rock Filter Inspection
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, Safety glasses, gloves, air compressor and air hose
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST23**

WORK DESCRIPTION

- ❑ Hire air compressor and air hose to suit bubbler type algae cleaning system.
- ❑ Attach air hose line to 1/4" quick connect fitting in Effluent Pumphouse.
- ❑ Open check valves fully in air line chamber, to allow air to feeder lines in rock filter.
- ❑ Start compressor to pump air to rock filter and dislodge any algae build up.
- ❑ Observe downstream chamber for extent of algae removal. Check effluent for clarity and odours.
- ❑ Inspection/Pumpout Chamber - inspect for algae build up in spring and fall. Pump out as required.
- ❑ Flush/rod cleanouts as required to remove algae build up.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST24**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Mechanical Aerators Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Week Days (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Week Day Mechanical Aerator Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST24**

WORK DESCRIPTION
❑ Observe all aerators are in operation and that proper aeration action is present in lagoon cells. Note steady circular water motion throughout all areas of cells (observe foam, etc. on surface) ❑ Visually check from shore all floats and mountings, swing arm assembly, mooring cables, and anchor posts. ❑ A 'snoring' noise indicates air entrapment. Rectify by adjusting shaft to steeper angle during quarterly maintenance task.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST25**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Mechanical Aerators Inspection and Maintenance	**RECEIVED BY:**	
FREQUENCY	Quarterly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Quarterly Mechanical Aerator Inspection and Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, maintenance truck, boat/paddles, life jackets, adjustable wrench
MATERIALS REQUIRED	Grease

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST25**

WORK DESCRIPTION
❑ Note: 2 persons required for safety. ❑ Grease aerators every 3 months as recommended by manufacturer. ❑ A 'snoring' noise indicates air entrapment. Rectify by adjusting shaft to steeper angle. ❑ Check all bolts, fittings, and attachments are secure. Tighten as required. Note any mooring cable stretch.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST26**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Weir and Bypass Chambers Inspection	**RECEIVED BY:**	
FREQUENCY	Weekly (est. 0.25 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Weekly Weir and Bypass Chambers Inspection		
TYPICAL OPERATING CONDITION			
COMMUNICATIONS REQUIRED	❑ Inform Homeowners	❑ Inform Agencies	❑ Inform Staff
EQUIPMENT REQUIRED	PPE		
MATERIALS REQUIRED			

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST26**

WORK DESCRIPTION
❑ Visually inspect all weir and bypass chamber structures, including gates and seals. Note operating levels are normal. Particular attention should be given to the first bypass chamber in the lagoon system which collects the most solids build up, grease, debris, etc.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST27**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Weir and Bypass Chambers Inspection & Maintenance	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 0.5 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Monthly Weir and Bypass Chambers Inspection & Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, fire hose
MATERIALS REQUIRED	

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST27**

WORK DESCRIPTION
❑ Hose down bypass chambers and remove solids built up, grease, floatables, debris, etc.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST28**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Weir and Bypass Chambers Inspection & Maintenance	**RECEIVED BY:**	
FREQUENCY	Quarterly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Quarterly Weir and Bypass Chambers Inspection & Maintenance
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, fire hose
MATERIALS REQUIRED	Grease

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Personal Protective Clothing and Equipment

WORK ORDER **ST28**

WORK DESCRIPTION
❑ Check fibreglass access grating for stability and note any signs of cracking, delaminating, loose fittings, etc. Operate all weir and bypass gates by opening and closing all the way to prevent mechanism from seizing. Grease stems as required. Outlet flows resulting from this exercise will be directed either to next cell in lagoon system, or to effluent wet well. ❑ Hose down chambers and gates to remove grease and solids build up, as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST29**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Effluent Quality Check	**RECEIVED BY:**	
FREQUENCY	Monthly (est. 2 labor hrs)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Effluent Quality Check at Sewage Lagoon
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE, sampling rod
MATERIALS REQUIRED	Sample bottles

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment
❑ Wastewater Systems Effluent Regulations [https://www.gazette.gc.ca/rp-pr/p2/2012/2012-07-18/html/sor-dors139-eng.html]

WORK ORDER **ST29**

WORK DESCRIPTION

- ❑ Fill out label on sample bottle as per laboratory requirements
- ❑ Indicate location and testing for Bacterial Oxygen Demand (BOD) and Total Suspended Solids (TSS)
- ❑ Attach sample bottle to end of sampling rod. Feed sample through opening in grating and immerse in effluent entering lagoon. Collect sample.
- ❑ Repeat at other chambers, collecting samples both upstream and downstream of rock filter as applicable.
- ❑ Wash hands, rinse off sampling rod and sample bottles. Place bottles in a cooler box with an ice pack. It is important to keep the samples cool or refrigerated prior to shipping.
- ❑ Ship the cooler box with sample bottles for independent testing of sewage effluent quality (BOD and TSS) within 4 hours of sampling.
- ❑ Upon sample results return, check compliance with regulatory parameters and action as required.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	**HOURS TO COMPLETE**	
REASON FOR VARIANCE			
PARTS USED			

WORK ORDER **ST30**

ASSET		**ORDER DATE**	
ASSET GROUP	SANITARY	**PO#**	
ASSET SUBGROUP	Treatment	**START DATE**	**END DATE**
ASSET COMPONENT	Lagoon		
TASK DESCRIPTION	Effluent Leakage Check	**RECEIVED BY:**	
FREQUENCY	Semiannual (est. 1 labor hr)		
KEY CONTACTS			
ASSET DESCRIPTION			
WORK LOCATION			

WORK DESCRIPTION	Effluent Leakage Check at Sewage Lagoon
TYPICAL OPERATING CONDITION	
COMMUNICATIONS REQUIRED	❑ Inform Homeowners ❑ Inform Agencies ❑ Inform Staff
EQUIPMENT REQUIRED	PPE
MATERIALS REQUIRED	Sample bottles

LABOR DESCRIPTION	HOURS	RATE	AMOUNT
Maintenance Supervisor			$ -
Maintenance Assistant			$ -
Truck			$ -
Contractor			$ -
Equipment			$ -
Parts + Materials			$ -
		LABOR TOTAL	**$ -**

REFERENCE DOCUMENTS

❑ Worksafe/Occupational Health & Safety Regulations:
❑ Ergonomics (MSI) Requirements
❑ Personal Protective Clothing and Equipment
❑ Wastewater Systems Effluent Regulations [https://www.gazette.gc.ca/rp-pr/p2/2012/2012-07-18/html/sor-dors139-eng.html]

WORK ORDER **ST30**

WORK DESCRIPTION
❑ Fill out label on sample bottle as per laboratory requirements ❑ Indicate location and testing for fecal coliform only. ❑ Collect sample at underdrain discharge outlet. ❑ Wash hands and rinse off sample bottle. Place bottle in a cooler box with an ice pack. It is important to keep the sample cool or refrigerated prior to shipping. ❑ Ship the cooler box with sample bottles for independent testing within 4 hours of sampling. ❑ Upon sample results return, check for indication of fecal bacteria, which may indicate leakage in lagoon liner membrane.

COMPLETION NOTES			
❑ Updated Maintenance Logs and Inspection Forms			
COMPLETED PROJECT VALUE	$	HOURS TO COMPLETE	
REASON FOR VARIANCE			
PARTS USED			

APPENDIX C

Glossary

Term	Definition
Action	An individual project or program, which implements a strategy to realize a specific result.
Asset	A combination of components that have value and enable services to be provided. ▪ *Dynamic assets* have moving parts (e.g. pumps, generators). ▪ *Passive assets* have no moving parts (sewers, water mains).
Asset management	Activities (e.g. technical, financial, policy, regulatory etc.) that use resources to develop, operate and maintain infrastructure to achieve the highest possible life cycle returns (economic, environmental, and social).
Asset management plan	A plan for managing one or more assets over their life cycle.
As-Built plan	Also referred to as "As-Constructed" drawings, "Record Drawings" or "Red Line" drawings, this refers to post-construction plans depicting location, size, and configuration of actual works installed. Generally As-Built plans are developed with the assistance of post-construction survey pickup of key components.
Backlog	The cumulative value of work, at a point in time, which is required to restore all assets in the inventory to their required level of service.
Condition monitoring	Periodic measurement and recording of asset condition.
Condition assessment	Periodic interpretation and evaluation of condition monitoring information to determine the need for preventative or remedial action, and to determine the asset's remaining service life at its intended level of service.
Critical assets	Assets for which the financial, business or service level consequences of failure are severe. Critical assets have a higher priority for action than non-critical assets.
Deferred maintenance	Maintenance that is conducted after the planned, optimal schedule. Maintenance conducted beyond the optimal schedule will generally cost more and will generally cause reductions in service quality.
Economic service life	The length of time during which an asset performs efficiently at its planned level (quality) of service. For example, the time period until the cost for maintenance and repairs exceeds the cost of replacement.
Life cycle cost	The cumulative cost of an asset (capital and O&M) over its service life.
Maintenance	All actions necessary to keep an asset performing at its required level of service, but excluding repairs, rehabilitation or renewal. Sample types of maintenance are:

	Planned maintenance: Falls into three categories: ▪ *Periodic* – necessary to ensure reliability or sustain the design life of an asset ▪ *Predictive* – condition monitoring activities used to predict failure ▪ *Preventative* – maintenance that can be initiated without routine or continuous checking and is not condition-based (e.g. using information from maintenance manuals, etc.). *Unplanned maintenance*: generally involves repairs under unplanned or emergency conditions
Maintenance plan	A plan that sets out the optimum policies, practices and schedules for asset maintenance.
Objective	The intended outcome/result of specific strategies and actions
Operation	The active process of using assets to deliver a service.
Performance measurement	Quantitative and/or qualitative assessment of actual performance in terms of specific objectives, targets, or standards.
Rehabilitation	Actions that restore the condition of an asset and extend its service life. Rehabilitation is generally an option to asset replacement. Examples include: machining of rotating surfaces, comprehensive replacement of parts, resurfacing roads, slip-lining sewers).
Repair	Actions that restore the operability of an asset after failure. Repairs may include replacement of selected parts but generally do not significantly extend the asset's service life.
Replacement	Renewal of an asset that has reached the end of its economic service life; renewal provides the same type and quality of service but can incorporate alternative, more efficient or effective technologies and approaches.
Replacement cost	The total cost (direct and indirect) for asset replacement.
Service Life	The length of time during which an asset performs at its planned level (quality) of service. This includes: planning, designing, commissioning, operating and maintaining, repairing, decommissioning or disposal. Service life can be measured as time, number of cycles, distance intervals, etc.
Strategy	An overall approach involving multiple actions to achieve a specific objective.