WATER UTILITY

Water Utility Definitions by Hyperlink

U-LOCAL FACTORS		
Local Factors	Is the Local Factors Description the same as the previous year's?	Please complete the Yes/No field for whether the Local Factors Description is unchanged from the previous year. If the answer is "Yes", then skip to field 32 Do you contribute power to the grid? (the database will be updated with the previous year's Local Factors Descriptions for fields 1 through 31). If the answer is "No", then complete the Local Factors Description fields 1 to 32.
	Local Economic Conditions	Describe what is unique of the local economic conditions in your utility. Is your Utility growing? What is the major industry in your utility? Does the industry effect water production?
	Raw Water Sources	Describe what unique raw water characteristics the water source has, including the name or type of the water source.
	Operational Procedures	Describe daily operational procedures. Do you believe there are differences between the procedures at your utility and those implemented at other utilities?
	Approach to Automation	Describe the utilities philosophy on automation. Also include what automation is currently in use and any future changes (e.g. how many pumps & reservoirs are on SCADA or similar?). Is the utility trying to move towards 100% automation?
	Age of System Components	What is the historical age of the utility? Do you believe the age of the utility affects the operations and maintenance costs of the utility? Does it affect the number of main breaks?
	Need for Raw Water or Treated Water Pumping	Is there a need for raw water pumping into the water treatment plant (low lift pumps) or treated water out of the water treatment plant (high lift pumps)? Are the low lift pumps/high lift pumps large power consumers?
	Approach to Metering	Describe the utilities approach to metering. Also include what metering is currently in use and any future changes. Is the utility trying to move towards 100% metered?
	Local Water Use Patterns	Is water consumption high in the Utility? What is the per capita volume of water consumed daily? Are residential or non-residential (ICI) properties high consumers?
	Length of the Distribution/ Transmission System	Does the length of your system affect the operations and maintenance costs of your system? Do field staff spend a lot of time driving from site to site?
	Details of Geography and Topography within Utility Boundary	Describe the topography of the area within the utility boundaries and how this affects the piping system. Do you think it increases costs?
	Proportion of ICI Customers	What is the proportion of ICI customers, are they high consumers and how does this additional demand affect the water treatment process and distribution system?
	Pipe materials	Describe what a majority of the pipe material is, are there any problem pipe materials that need to be replaced/repaired or cleaned more often? Is corrosion an issue with certain pipe materials? Describe any programs or efforts for maintaining watermain of different materials.
	Seasonal Population Variations	Are there large seasonal population variations in the utility? Is there a University which the utility services which impacts water consumption? Are there large festivals or seasons which impact usage?
	Regulations	Does your utility have to adhere to any unique regulations or by-laws which affect the way the utility operates?
	Energy Consumption	Do you have high or low energy consumption? What may cause this such as topography or temperature range?
	Climatic Conditions	Average summer air temperature? Do you believe climatic conditions affects the operations of your WTP or distribution system? For example, dry summer conditions may encourage heavy irrigation and high water demand. Provide details of climatic conditions for year of data collection, e.g. typical/wet/dry year.
	Average Winter Temperature	Give the Average Winter Temperature in degrees Celsius.
	Unit Processes within the Treatment Plant	Are there any unique unit processes operated at your water treatment plant that may affect the operations and maintenance of the plant?
	Design Capacity/Facility Size	Is there room on-site for future growth and capacity of the plant? Does the restrictive site impact operations and maintenance of the utility?
	Design Life Remaining/ Growth Rate of Supply Area	Describe the design life remaining of the treatment plant and the distribution/transmission system. Estimate using the growth rate of the supply area when and what future construction is required.

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	Level of Emergency Preparedness	What is the level of emergency preparedness at the utility? Does the utility have an emergency plan? Is there a chain of command in emergency circumstances?
	Level of Redundancy of Critical Equipment	% redundancy of critical equipment in place. What is the utility's standard regarding stand-by and back-up equipment?
	Hours of Attended Operation	Describe the hours and number of staff that operate the treatment plant. Separately describe the hours and number of staff that operate the pumping stations.
	Fraction of Work that is Out-Sourced	Describe the utility's approach to outsourcing work to external contractors. What percentage of work is out-sourced to external contractors in your utility?
	Percent of Unionized Workforce	What percentage of the workforce is unionized? Do you believe this impacts operations and maintenance?
	Shared Services	What services are shared in your utility? For example fleet, HR, IT, finance, customer billing etc. Who are they shared with, water and wastewater? Water treatment and distribution? Water and transportation?
	Urban versus Suburban Environment	Within the supply area, describe how the urban versus the suburban areas are serviced.
	Combined Billing (Water/ Wastewater)	Is there combined billing in your utility? For example does the bill the owner receives from the Utility include both water and wastewater? Does it also include hydro?
	Wholesale vs. Retail Billing	Does the utility bill the homeowner or the municipality? i.e. is the utility a wholesale supplier to member municipalities through a transmission system or is the utility a retail supplier to individual customers through a distribution/integrated system?
	Staffing Turnover Rate	*Calculate by taking the "number of employees who have left the organization within the calendar year / (number of employees as of January 1st + number of employees hired during the calendar year)". Includes part time but not temporary employees.*
	Soil Conditions	Describe the surrounding soil conditions in which the water mains are buried. pH levels, soil type and other characteristics of the soil that affect the pipe materials and are affected by the climate.
	Do you contribute power to the grid?	Yes/no answer required. Please provide details if power is contributed to the grid from the treatment plants or distribution system. For example agreements with hydro utilities to synchronize generators with the grid to provide additional power when required.
U-Rates and Financing		
Labour Rates	*Distribution System and Treatment Plant Field Staff*	*Add the hourly wages paid to field staff according to the different classes defined by your certifying provincial authority. Rates should exclude all benefits paid by the employer on the employees behalf.*
Certification of Field Staff	*Certified Distribution System and Treatment Plant Field Staff*	Enter the number of certified field staff employed at each certification level for the distribution system and the treatment plant (where certification is based on experience and the successful completion of training and examinations to the requirements of the Provincial Regulator). Record only the highest certification gained by any one staff member, unless that staff member is cross trained between treatment and collection, whereupon a second certification may be added.
Billing Rates	Residential Rates Based on Meter Size	Answer Yes in the "Yes/No" field if residential water rates are based on meter or connection size (if not, answer "No"). Also describe in the Notes field the fee structure based on meter or connection size (include description of the flat fee if applicable).
	Residential Rates Based on Usage	Answer Yes in the "Yes/No" field if residential water rates are based on water consumption (if not, answer "No"). Also describe in the Notes field the fee structure based on consumption (include description of the flat fee if applicable).
	Metered Industrial/ Commercial/Institutional Water Use	Yes/no answer is required, is ICI (non-residential) water use metered?
	ICI (Industrial /Commercial/Institution) Rates Based on Meter Size	Answer Yes in the "Yes/No" field if ICI water rates are based on meter or connection size (if not, answer "No"). Also describe the fee structure for ICI (non-residential) water rates based on meter or connection size (include description of the flat fee if applicable).

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Water Utility Definitions by Hyperlink

	ICI (Industrial /Commercial/Institution) Rates Based on Usage	Answer Yes in the "Yes/No" field if ICI water rates are based on water consumption (if not, answer "No"). Also describe the fee structure for ICI (non-residential) water rates based on meter size (include description of the flat fee if applicable).
	Metered Residential Water use	Yes/no answer is required, is residential water use metered?
	Wholesale Rates	Answer Yes in the "Yes/No" field if the water utility has wholesale rates (if not, answer "No"). Also describe how the utility calculates the wholesale rates. Wholesale rates typically apply when a water utility supplies water to member municipalities (wholesale customers) through a transmission system. Wholesale rates can also apply to a water utility that supplies water to individual wholesale customers who then sell it on to retail customers, for e.g. an agricultural wholesaler.
Billing Frequency	Residential Billing Frequency	Yes/no answer is required with further explanation to be placed in the notes field. Is the residential billing frequency Monthly, Quarterly, Annually or Other? If "Other" applies, please describe in the Notes field.
	ICI Billing Frequency	Yes/no answer is required with further explanation to be placed in the notes field. Is the ICI (non-residential) billing frequency Monthly, Quarterly, Annually or Other? If "Other" applies, please describe in the Notes field.
Financing	Do you finance with DCC?	Yes/no answer is required for whether DCC financing is used to finance capital projects. DCC = Development cost charges.
	Do you finance with Debt?	Yes/no answer is required for whether debt financing is used to finance capital projects. Debt is typically a bank loan or municipal bonds.
	Do you finance with Pay as You Go?	Yes/no answer is required for whether no debt is issued to pay for capital projects.
	Principal paid on debt	Money paid on the water utility debt principal during the year.
	Interest paid on debt	Amount of interest paid on the water utility debt during the year.
	Principal outstanding	Water utility debt (principal) carried by the organization at year end.
Climate Characteristics	Total Precipitation	The sum of the total rainfall and the water equivalent of the total snowfall observed during the year.
	Total Rainfall	The total rainfall, or amount of all liquid precipitation such as rain, drizzle, freezing rain, and hail, observed during the year.
	Total Snowfall	The total snowfall, or amount of frozen (solid) precipitation in cm such as snow and ice pellets, observed during the year. (expressed as mm of equivalent rainfall where 10mm of snowfall = 1 mm of rainfall)
	Average Summer Temperature	The average temperature from May 1st to September 30th.
	Average Winter Temperature	The average temperature from October 1st to April 30th.

U-Performance

Goal 2	Total treated water storage capacity within pipe system	Sum of treated water storage capacity *(owned and operated)* within pipe system, i.e. sum of all reservoir capacities within transmission/integrated/distribution system (units ML). Treated water that would be available in an emergency.
	Total treated water storage capacity at treatment plants	Sum of treated water storage capacity *(owned and operated)* within all utility treatment plants (even if some are not benchmarked) (units ML). Treated water that would be available in an emergency.
	Utility ADD	Average Day Demand (ML/day) for the water utility *(excludes volume exported to neighbouring regions/municipalities)*. Annual average of all daily flows through the water utility i.e. distribution or integrated or transmission system (units used are ML/day). ADD = Total Annual Flow (ML) / 365(days).
Goal 3	Total water operating cost	The sum of all annual operating costs (O&M and indirect charge-backs) for water treatment and distribution/transmission systems. Include costs for all plants and systems in the water utility whether benchmarked individually or not. Includes all costs related to infrastructure that the utility owns and operates. *Includes O&M revenues for treated water supplied to neighbouring regions/municipalities.* Excludes capital costs and costs. Excludes Bulk water purchase (considered separately).
	Bulk water purchased (distribution utilities only)	The total cost of water purchased from regional supplier(s). Applies only to distribution utilities. *Any fees associated with capital costs should be excluded.*

WATER UTILITY

Water Utility Definitions by Hyperlink

	Cost of all water quality monitoring	Annual costs of all water quality monitoring for the water utility, i.e. includes monitoring for the distribution/transmission system and all water treatment plants (including sources). Includes laboratory wages, supplies, contracted work etc. Includes costs for all plants and systems in the water utility whether benchmarked individually or not. Excludes costs of replacing equipment such as analysers and includes costs of process tests e.g. from filters.
	Cost of water customer billing	The water utility cost to bill customers. If there is shared customer billing, for example water and wastewater, then need to allocate cost specifically for the water utility (if unknown then allocate by # of customers). Excludes cost of metering O&M and meter reading. Record cost of metering O&M separately under heading Distribution-Goal 3-Metering O&M Costs. Record cost of meter reading separately under heading Distribution-Goal 3-Other Costs.
	Total population served by water utility	Total population, *excluding ICI equivalents and population equivalents for treated water supplied to neighbouring regions/municipalities,* served by all water utility infrastructure (transmission/ distribution system and all treatment plants and wells). In most but not all cases, this figure will be the same as that entered under the Distribution-Description data tab (exceptions include cities that only benchmark a portion of their water distribution system or cities that manage more than one distribution or transmission system). *Note that this number may well be different to the City's recorded population and, where possible, should estimate the typical number of residents receiving service.*
	Water rate for a typical size SF residential connection (consuming 330 m^3/year)	The current year (i.e. the year of data collection, not the historic year) annual water rate for a house with a typical size single family residential connection or water meter (i.e. for a detached house) consuming 330 m^3/year (equivalent to 3 people at 300L/person/day). The typical size should be the most common (i.e. in most cases at least 50% of the single family connections or meters). For municipalities with metered SF residential connections, the annual cost of water will usually include the base fee for the typical meter size X the frequency of base fee charge + the annual price per cubic meter X 300m^3. For municipalities without metered SF residential connections, the annual cost of water will include the flat fee X the frequency of flat fee charge. Include all monies the family pays including any parcel taxes which go towards water to support fire fighting.
	Do you cover the costs of collecting distribution system samples for water quality?	Reply yes/no, depending on whether the water utility covers the costs of collecting distribution system samples for water quality (the answer is no in cases where an outside body such as the regional water supplier or the provincial authority covers the costs).
	Do you cover the costs of testing distribution system sample for water quality	Reply yes/no, depending on whether the water utility covers the costs of testing distribution system samples for water quality (the answer is no in cases where an outside body such as the regional water supplier or the provincial authority covers the costs).
	Total Number of Service Connections (retail customers)	=# of residential service connections + # of ICI service connections. Service connections are the pipes that lead from the distribution water main to the customer's plumbing. Total # of service connections = # of retail customers. In most but not all cases, this figure will be the same as that entered under the Distribution-Description data tab (exceptions include cities that only benchmark a portion of their water distribution system or cities that manage more than one distribution or transmission system).
	Total Number of Metered Service Connections (retail customers)	*# of service connections that have an installed water meter.*
	Cost of Source Water Protection	The total cost of a source water protection program, including all activities required in monitoring the water source, cleaning, fencing, etc.
Goal 4	# of days when a boil water advisory was in effect	# of days when a boil water advisory issued by the regulatory authorities was in effect.
	# of households affected by the boil water advisory	# of households that are supplied water by the service connections (residential and ICI) affected by the boil water advisory issued by the regulatory authorities
	# of people affected by the boil water advisory	# of people that are supplied water by the service connections (residential and ICI) affected by the boil water advisory issued by the regulatory authorities.

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Water Utility Definitions by Hyperlink

	# of days when a water advisory was in effect	# of days when a water advisory issued by the regulatory authorities was in effect. Advisories issued due to high levels of chemicals, metals or other substances that are not affected by boiling the water. Examples include high levels of lead, potassium permanganate, or products such as soap which may be introduced into the system by a backflow event. Excludes boil water advisories.
	# of households affected by the water advisory	# of households that are supplied water by the service connections (residential and ICI) affected by the water advisory issued by the regulatory authorities
	# of people affected by the water advisory	# of people that are supplied water by the service connections (residential and ICI) affected by the boil advisory issued by the regulatory authorities.
Goal 6	Total # of water quality complaints	Total # of customer complaints received at the customer service centre/plant/public works yard. Include all complaints related to water quality, i.e. taste and odour, colour and temperature and other or unknown quality related issues. If the breakdown into different categories is available, provide this data in the relevant fields. Note: A complaint requires follow-up action and should not include general inquiries.
	Do you track and log customer calls?	Answer "Yes" only if there is a published phone number that the public can call to make a complaint or inquiry regarding the water utility (for example a complaint about poor water quality) AND these calls are tracked and logged.
Goal 7	Do you have a water conservation program?	Yes/No answer required for whether the water utility has a program promoting conservation of potable water.
	Cost of water conservation program	Includes all costs incurred by the utility during that year for the program promoting conservation of potable water.
	Per capita average day consumption for residential customers	Annual average daily per capita residential water consumption in l/capita/day = Total volume delivered to residential customers in ML / 365 days / population served * 1,000,000 litres per ML. If the Total volume delivered to residential customers is unknown due to lack of metering then no data should be provided unless there are estimates for residential consumption based on studies. *(Should be based on your own residential customers and exclude treated water supplied to neighbouring regions/municipalities.)*
	Per capita peak day consumption for residential customers	Annual maximum daily water consumption for residential customers. If the Total volume delivered to residential customers is unknown due to lack of metering then no data should be provided unless there are estimates for residential consumption based on studies. *(Should be based on your own residential customers and exclude treated water supplied to neighbouring regions/municipalities.)*
	Total # of days of water restrictions	Total number of days during the year where the municipality had to impose water use restrictions to manage demand. Includes both mandatory and voluntary restrictions (collect separately the number of each).
	# of days of water restrictions - voluntary	Number of days during the year where the municipality had to impose voluntary water use restrictions to manage demand (i.e. the public are not fined if they do not comply).
	# of days of water restrictions - mandatory	Number of days during the year where the municipality had to impose mandatory water use restrictions to manage demand (i.e. the public are fined if they do not comply).
	Do you inform the public on water usage?	Yes/No answer required for whether the water utility informs the public on actual water usage figures, for example through the radio, website, brochures etc.
Goal 8	Cost of customer communication	Includes all costs incurred by the utility to communicate with customers, includes customer service centre wages, equipment and supplies, costs to produce brochures, costs to publish water quality results on the internet etc.
	Is the water utility ISO certified?	Yes/no answer is required with further explanation to be placed in the notes field. ISO - International Organization for Standardization.
	Have you conducted an energy audit of the water utility?	Yes/no answer is required with further explanation to be placed in the notes field.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

D-DESCRIPTION		
Volume Conveyed and Population Served	Population served	The population, *excluding ICI equivalents and population equivalents for treated water supplied to neighbouring regions/municipalities,* served by the distribution/transmission system. This includes the population of all wholesale and retail customers. *Note that this number may well be different to the City's recorded population and, where possible, should estimate the typical number of residents receiving service.*
	Average day demand	Annual average of all daily flows through the distribution/transmission system (units used are ML/day). Average Day Demand = Total Annual Flow (ML)/365(days) *(Include treated water volume supplied to neighbouring regions/municipalities)*
	Maximum day demand	Maximum volume per day flowing through the distribution/transmission system for any day in the year (units used are ML/day). *(Include treated water volume supplied to neighbouring regions/municipalities)*
	Total volume distributed from treatment plants	The total volume of treated water received from the treatment plants to the distribution/transmission system. Equals the total treated water if there is only one treatment plant delivering water to the transmission/distribution system. *(Include treated water volume supplied to neighbouring regions/municipalities)*
	Volume delivered to residential customers : multi-family	Annual volume of treated water delivered to residential customers in multi-family residences (may have to be estimated if not all multi-family residential customers are metered). Multi-family residences includes apartment buildings, and condos, sometimes these have a medium or large meter due to the increased water consumption. If multi-family consumption is not recorded separately from single-family consumption then record all residential consumption under single-family consumption. *(Excludes treated water volumes exported to neighbouring municipalities.)*
	Volume delivered to residential customers : single family	Annual volume of treated water delivered to residential customers for single family residents (may have to be estimated if not all single family residential customers are metered). Single family residents are individual homes or semi-attached with separate connection service. If multi-family consumption is not recorded separately from single-family consumption then record all residential consumption under single-family consumption. *(Excludes treated water volumes exported to neighbouring municipalities.)*
	Volume delivered to ICI customers	Annual volume of treated water delivered to ICI customers (may have to be estimated if not all ICI customers are metered). *(Excludes treated water volumes exported to neighbouring municipalities.)*
	Volume imported from neighbouring municipalities	Annual volume of treated water imported from neighbouring municipalities.
	Volume exported to neighbouring municipalities	Annual volume of treated water exported to neighbouring municipalities.
	Billed unmetered volume	Volume of water that is billed but not metered, for example, the estimated volume used by the Fire Department if it is charged a flat rate for water usage but the consumption is unmetered. For unmetered ICI and residential customers, the estimated volume can be provided under the cells “Volumes delivered to residential customers” and “Volumes delivered to ICI customers”.
	Total non-revenue water volume	Quantity of water that does not provide any revenue to the utility. NRW= Total volume delivered from the treatment plants – Billed authorized consumption. (Where the billed authorized consumption = Total volume delivered to residential customers (single & multi family) + Total volume delivered to ICI customers + Billed unmetered volume). If the water distribution system is not universally
System Category	Transmission system	Each system should choose only one category by selecting "Yes" for the appropriate category: transmission, distribution or integrated system. Transmission systems carry water from the source to the treatment plant and from the treatment plant to the distribution system. Typically larger diameter mains than the distribution system.
	Distribution system	Each system should choose only one category by selecting "Yes" for the appropriate category: transmission, distribution or integrated system. Distribution systems carry water from the transmission system and distribute it to customers.
	Integrated transmission and distribution System	Each system should choose only one category by selecting "Yes" for the appropriate category: transmission, distribution or integrated system. Integrated systems have both transmission and distribution system pipes. An integrated system provides services from the source to the tap, i.e. has both treatment plants and retail customers.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Classification of system	The Classification given to the distribution system by the Provincial Regulatory Agency - Class I, Class II, Class III, Class IV (note there may be differences in classification between the provinces). Be specific of the definition of this class category in the notes fields following the data fields.
System Components	Area of system	Approximate supply area covered by the distribution/transmission/integrated system (km^2).
	# of wholesale customers	Wholesale customers sell water to retail customers (for example regional municipalities typically sell water to city municipalities who are their wholesale customers).
	Total # of service connections	# of residential service connections + # of ICI service connections. Service connections are the pipes that lead from the distribution water main to the customer's plumbing. Total # of service connections # of retail customers.
	# of residential service connections : multi-family	# of service connections that serve multi-family residential customers. Multi-family includes apartment and condo buildings, etc.
	# of metered residential service connections : multi-family	# of service connections that serve multi-family residential customers that have an installed water meter. Multi-family includes apartment and condo buildings, etc.
	# of residential service connections : single family	# of service connections that serve single family residential customers. Single families are houses or duplex where each separate living quarter has its own water meter.
	# of metered residential service connections: single family	# of service connections that serve single family residential customers that have an installed water meter. Single families are houses or duplex where each separate living quarter has its own water meter.
	# of ICI service connections	# of service connections that serve industrial, commercial or institutional customers (i.e. non-residential).
	# of metered ICI service connections	# of service connections that serve industrial, commercial or institutional customers that have an installed water meter.
	# of hydrants	Total # of hydrant assemblies in the distribution/integrated system.
	# of valves	Includes all mainline valves in the distribution/integrated/transmission system. Pressure reducing valves, air relief valves and hydrant valves are not included.
	# of pressure reducing valve stations	Number of pressure reducing valve stations in the distribution/transmission/ integrated system (note number of individual PRVs in the Notes field).
	# of chambers	Number of large structures (larger than manholes) in the distribution/ transmission/integrated system.
	Total # of meters	The sum of all meters within the distribution/transmission system. In some cases this will be greater than the number of metered service connections due to some properties having many meters (e.g. if a strata has a meter at the property line plus meters at each unit).
Pipes	Average nominal diameter	This is a length weighted average of the nominal pipe diameters. = ((length of pipe at diameter x)(diameter x) + (length of pipe at diameter y)(diameter y) + …..) / total length of pipe Where diameter x = average diameter of diameter range x, for example for range 201mm–300mm, the average diameter is 250.5 mm, therefore diameter x = 250.5.
	Length: D1 – D2 mm diameter	Kilometre length of distribution/transmission/integrated system that is diameter D1 to D2 in mm.
	Average depth of cover	The average depth of cover over buried water mains. Units in metres.
	Total Length	Total length of main in the distribution/transmission/integrated system (i.e. excluding length of service connections, *hydrant leads and standpipe leads*). For the distribution system length include all connecting pipes between pump stations, rechlorination facilities and storage facilities if these are located within the distribution system. For the transmission system length include all connecting pipes between pump stations, rechlorination facilities and storage facilities when located between the source and the treatment plant or between the treatment plant and the distribution system.
Material Age and Length	Material and Age Lengths	Where data is available, enter in the "Total Length (km)" line the total length of main your system comprises for each age range specified (e.g. 0-24 years). The total length of main based on all age ranges should automatically calculate. Where data is available, provide the percentage of the length in each age range for each material (e.g. 20% of total length for an age range may be PVC). The column "Material Length (km)" will automatically calculate the length in km for each pipe material from the % of pipe materials in each age range and the length of pipe in each age range. Or if only the total lengths for each pipe materials are known (not the % in each age range), enter these in the "Material Length (km)" column. The % material columns should sum to 100%.

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Distribution/ Transmission Definitions by Hyperlinks

	Material Length	The column "Material Length (km)" will automatically calculate the length in km for each pipe material from the % of pipe materials in each age range. Or if only the total lengths for each pipe materials are known (not the % in each age range), enter these in this column.
Cathodic Protection	Length of main requiring cathodic protection	Length of main that requires cathodic protection to prevent corrosion at year end (i.e. excludes all main that was cathodically protected during the year).
	Length of main with cathodic protection	Length of main that has cathodic protection at year end (i.e. includes all main that was cathodically protected during the year plus the length that was cathodically protected during previous years).
Age	Average age	This is a length weighted average of the pipe ages. = ((length of pipe at age x)(age x) + (length of pipe at age y)(age y) + …..) / total length of pipe. Where age x = average age of age range x, for example for range 0 – 24 years, the average age is 12, therefore age x = 12.
	Original construction date	Date of first construction of the distribution/transmission/integrated system or plant i.e. the oldest structure on site.
Rechlorination Facilities	Rechlorination facilities	Rechlorination facilities are designed to maintain a disinfectant residual (typically chlorine) within the distribution system to prevent re-growth of bacteria and other pathogenic microorganisms.
	# of facilities using chlorine gas	Number of rechlorination facilities that use chlorine gas. See also “Rechlorination facilities".
	# of facilities using liquid chlorine	Number of rechlorination facilities that use liquid chlorine. See also “Rechlorination facilities".
	# of facilities using chlorine pucks	Number of rechlorination facilities that use chlorine pucks. See also “Rechlorination facilities".
	# of facilities using onsite chlorine generation	Number of rechlorination facilities that use onsite chlorine generation. See also “Rechlorination facilities".
	Total capacity (rechlorination facilities)	The total combined capacity for all rechlorination facilities, including all standby units.
Storage Facilities	Storage Facilities	Storage Facilities include water reservoirs and elevated tanks within the distribution/integrated/transmission system (exclude storage at treatment plant).
	# of reservoirs (storage facilities)	Number of storage facilities *(owned and operated)* including reservoirs and elevated tanks (exclude storage at treatment plant). See also “Storage Facilities".
	Total storage capacity of reservoirs	Total storage capacity of storage facilities in the distribution/transmission/ integrated system including reservoirs and elevated tanks (exclude storage at treatment plant). Units are ML. See also “Storage Facilities".
Pump Stations	Total # of Pressure Zones	Number of different water pressure zones that exist in the municipality service boundaries.
	Total # of pump stations	Number of pump stations within the distribution/transmission system. Does not include the water treatment plant pump stations (high or low lift).
	# of pump stations with A-B Hp	The number of pump stations in each pump station horsepower range e.g. A-B Hp (total pump horsepower including standby pumps).
	Total Hp for all pump stations	Sum of the pump station horsepower for all pumps (including standby) in all pump stations in the distribution system. Exclude any pumps that are required to pump from the water treatment plant to the distribution system (treated water pumps within the treatment plant).
	Total flow capacity of pump stations	Sum of the pump station capacities for all pumps (including standby) in all pump stations in the distribution system. Exclude any pumps that are required to pump from the water treatment plant to the distribution system (treated water pumps within the treatment plant).
	# of P.S. (pump stations) with backup power	Number of pump stations equipped with an additional power supply to power critical equipment in case of a power failure. For example this would include the number of pump stations equipped with back-up diesel generators in case of a failure in the municipal power supply. Not all equipment in the pump station would need to be powered by the back-up generator. For example if only the duty pumps are backup powered by the generator, than the pump station would be designated as having backup power.
Meter Reading	Meter reading methods	Meter reading methods have been divided into either manual or electronic with four categories in total: manual by visual reading of meters; manual by onsite download of meters; electronic by radio download; and electronic by phone download. An “other” category is provided for those utilities to describe methods they use that do not fit into the above four categories.
	Manual: visual reading of meters	On-site: Manual recording of meter readings by visually viewing the meters. If you use this form of meter reading answer "Yes" in the "Yes/No" field, provide also the "% of connections" that this method applies to and what "% of flow" comes from these connections. If you do not use this form of meter reading answer "No" in the "Yes/No" field.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Manual: onsite download of meters	On-site: Electronic recording of meter readings with hand-held device. If you use this form of meter reading answer "Yes" in the "Yes/No" field, provide also the "% of connections" that this method applies to and what "% of flow" comes from these connections. If you do not use this form of meter reading answer "No" in the "Yes/No" field.
	Electronic : download by radio	Off-site: Meter readings are electronically downloaded using a radio link. If you use this form of meter reading answer "Yes" in the "Yes/No" field, provide also the "% of connections" that this method applies to and what "% of flow" comes from these connections. If you do not use this form of meter reading answer "No" in the "Yes/No" field.
	Electronic : download by phone	Off-site: Meter readings are electronically downloaded using a phone line. If you use this form of meter reading answer "Yes" in the "Yes/No" field, provide also the "% of connections" that this method applies to and what "% of flow" comes from these connections. If you do not use this form of meter reading answer "No" in the "Yes/No" field.
	Electronic : touch-read	On-site: Electronic recording of meter readings with a portable touch-read device. If you use this form of meter reading answer "Yes" in the "Yes/No" field, provide also the "% of connections" that this method applies to and what "% of flow" comes from these connections. If you do not use this form of meter reading answer "No" in the "Yes/No" field.
Meter Reading Frequency	Residential Meter Reading Frequency	Yes/no answer is required with further explanation to be placed in the notes field. Is the residential meter reading frequency Monthly, Quarterly, Annually or Other? If "Other" applies, please describe in the Notes field.
	ICI Meter Reading Frequency	Yes/no answer is required with further explanation to be placed in the notes field. Is the ICI meter reading frequency Monthly, Quarterly, Annually or Other? If "Other" applies, please describe in the Notes field.
Meter Reading Details	# of meter reading per year	Number of meter readings including meters read more than once in the year. This can be approximated by the Sum of (residential meter reading frequency multiplied by # of residential meters read) and (ICI meter reading frequency multiplied by # of ICI meters read).
	Do you do multiple meter reading?	Yes/no answer is required with further explanation to be placed in the notes field. Multiple meter reading occurs when other utility meters read at the same time as the water meter, for example the gas meter or hydro meter.
D-RELIABLE AND SUSTAINABLE		
Maintenance	Planned Maintenance	Planned maintenance includes all routine maintenance tasks that are identified through observation, etc (time spent maintaining equipment after it is observed that the equipment is at risk of breaking down).
	# of Planned Service Connections Repairs/ Replacements	Regularly scheduled or preventative maintenance repairs to mains that are identified through observation. Only includes repairs to the service connections for which the municipality is responsible. Service connections are defined as the pipe between the main and the property line.
	# of curb stop replacements	# of planned and emergency replacements of the curb stop only (not the service connection pipe). Distribution and integrated systems only.
	# of valves cycled *(once)*	# of mainline valves that were cycled or exercised. Include every valve cycling occurrence. *This metric measures the reach of the valve cycling program.*
	# of Valves Cycled - Total	*Total number of valve cycling occurrences, which includes valves cycled more than once per year.*
	# of Hydrants *Inspected*	Hydrant checks can include checking operation, caps, oil, pressure, sounding access, winter leakage, freezing, and string test. If flow is checked, this is limited to ensuring that the hydrant flows on opening, and includes a performance check on flow rate. Hydrant checks are required by the Fire Code (frequency is dependant on local factors). Winter checks can be limited to checking access, evidence of leakage and using a string test to determine if there is water leakage. *(Previously called a "Level A Check").*
	# of Summer Hydrant *Inspections*	Number of hydrants checked in the summer from May to September. See also "# of hydrants checked". The sum of summer hydrant checks and winter hydrant checks should equal the # of Hydrants Checked.
	# of Winter Hydrant *Inspections*	Number of hydrants checked in the winter from October to April. See also "# of hydrants checked". The sum of summer hydrant checks and winter hydrant checks should equal the # of Hydrants Checked.
	# of Hydrant *Teardown*	*Hydrant tear down typically follow a hydrant inspections and includes a full teardown or more thorough inspection. (Previously called a Level B Inspection)*
	Length of main relined	Total length of water mains that are relined including all cement lining of cast iron mains.
	Length of main replaced	Total length of water mains that are replaced in a planned situation (non-emergency). See also “Planned Maintenance.”

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

Main Breaks	# of Main Breaks - *minor*	*Small breaks that can be repaired without replacing a section of main. For example pinholes that may be plugged of "staked", breaks where a simple clamp may be used to make the repair, or a fitting is refurbished.* In table, separate into categories by material type, main breaks-minor for each category.
	# of Main Breaks - major	*Significant breaks that require cut out and replacement of some length of pipe or major fitting (that could not be repaired by a simple clamp.) For example where a PVC pipe has a longitudinal crack, an old section of pipe has collapsed or a fitting is in need of complete replacement.* In table, separate into categories by material type, main breaks-major for each category.
	# of Main Breaks - unknown	*Breaks that are know to have been fixed, but where data is unavailable to define as minor or major.*
	Total # of Main Breaks	# of occurrences of distribution or transmission main breaks (include all breaks whether in the pipe or joints), includes pinholes and major breaks.
Reliability	Emergency Maintenance (Unplanned Maintenance)	Emergency maintenance are high and low emergency work (time spent repairing equipment after it has broken down). High emergency work covers breakdowns that may result in loss of service or other severe detriment to the utility (e.g.; water main break, etc.), maintenance must be deployed as soon as possible. Low emergency work covers breakdowns, which may not result in loss of service or are protected by equipment redundancy; maintenance shall be deployed as the earliest convenience.
	# of inoperable or leaking valves	# of occurrences that mainline valves are known to be inoperable or leaking.
	# of inoperable or leaking hydrants	# of occurrences that hydrants are known to be inoperable or leaking (including hydrant valves). Typically identified by maintenance on hydrants. There are two levels of maintenance on hydrants 1) Minor maintenance: mechanical taking apart the hydrant assembly, fixing, putting back together. 2) Major maintenance: involving excavation, bringing in a construction crew, replacing or repairing the entire assembly. Distribution and integrated systems only.
	# of unplanned system interruptions	Includes any water stoppage to customers due to failure in the publicly managed water transmission and/or distribution system for which the utility is responsible. This excludes planned interruptions. See also "Emergency Maintenance." *This number may equate* to the number of occurrences of main breaks, emergency service connection repairs and pump station failures.
	Total duration of unplanned system interruptions	The sum of hours that customers were out of water for all unplanned system interruptions that occurred during the year. See also "# of unplanned system interruptions."
	# of Service Connections affected by Unplanned System Interruptions	Number of service connections affected by unplanned system interruptions. If a number is unavailable, this can be estimated by taking an average number of service connections affected by unplanned interruptions multiplied by number of unplanned system interruptions. See also "# of unplanned system interruptions."
	# of people affected by unplanned system interruptions	# of people that had their supply of water through service connections (residential and ICI) affected by all unplanned system interruptions.
	# of pump station failures	# of pump station breakdowns which were not protected by equipment redundancy or reservoir storage and resulted in a loss of pumping capacity and an inability to meet demand.
	# of rechlorination facility failures	# of rechlorination facility breakdowns which were not protected by equipment redundancy and resulted in a loss of rechlorination capacity and an inability to meet demand.
Service Connection Issues	# of Emergency Service Connection Repairs/ Replacements	Repairs to service connections due to breakdowns (either high or low emergency). High emergency breakdowns may result in loss of service or other severe detriment to the utility (e.g.; spill, etc.), maintenance must be deployed as soon as possible. Low emergency breakdowns may not result in loss of service or are protected by equipment redundancy, maintenance shall be deployed as the earliest convenience. Only includes repairs to the service connections for which the municipality is responsible. Service connections are defined as the pipe between the main and the property line.
	Responsibility for service connection - water main to house	Answer yes or no whether the municipality is legally responsible for maintaining the entire length of the service connection from the water main to the house
	Responsibility for service connection - water main to property line	Answer yes or no whether the municipality is legally responsible for maintaining only the service connection length only from the water main to the property line

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

Replacement Value	Total Replacement Value	The amount of money needed to replace all of the existing infrastructure. The replacement value shall include all engineering costs, construction, supervision, taxes, etc (excluding land purchasing). If this value is developed by a calculations based on unit values times the number of units, unit replacement values shall be estimated based on average construction costs over the last 5 years. For example, if 20 main replacements have been constructed over the last five years, the average unit cost per km of main can be estimated from all 20 construction projects (excluding inflation).
	Water Mains	The amount of money needed to replace all of the existing water distribution mains. Include all service connections, line valves, air valves, washouts, hydrants, water sampling points, pressure reducing valves, water meters and associated chambers; and any similar infrastructure. See "Total Replacement
	Storage Facilities	The amount of money needed to replace all of the existing potable water storage facilities and related infrastructure. Do not include raw water storage facilities (these are included in water treatment collection sheets). See "Replacement value total system" definition.
	Pump Stations and Rechlorination Facilities	The amount of money needed to replace all of the existing pump stations (booster stations) and rechlorination facilities and related infrastructure. See "Replacement value total system" definition.
	Other Supporting Infrastructure	Include any other system infrastructure not listed above.
	Confidence rating	Rate how confident you are with the values provided. Allocate a rating of 3 down to 1 according to whether your supporting data set is: 3. robust and fully auditable 2. partially anecdotal, often requiring some degree of interpretation 1. anecdotal
D-SUFFICIENT QUANTITY		
Water Model	Is there a water model in place?	Yes/no answer is required with further explanation to be placed in the notes field. Does your municipality have a working water model such as H2O Net?
	If yes, does the model include water quality modeling?	Yes/no answer is required with further explanation to be placed in the notes field. Are you able to model water quality throughout the water distribution system?
	Notes - Water Model	Does your municipality actively maintain a hydraulic model? All-pipes? Trunks Only? What are the main uses for your hydraulic models? Design/Planning Uses? Operational Uses? What data/methods do you use to calibrate your hydraulic model? SCADA data review? Hydrant Flow Testing? Hazen Williams C-Factor testing? 7-day flow/pressure monitoring? Inverse Transient Calibration? Genetic Algorithms? Who is responsible for model calibration? Operations staff? Engineering Staff? Consultants? Vendors? What software do you use to maintain your hydraulic model?
D-Sustainable Cost		
Costs-Contracting	Are *significant portions of* your operations externally provided by a contracted service?	Yes/no answer is required with further explanation to be placed in the notes field. If *significant portions of* the system operations are undertaken by an external company or contracted service, then answer Yes. *ex. OCWA, EPCOR)*
	Estimate for % of O&M work provided by a contracted service	An estimate for the percentage of O&M work that is externally contracted (ie. excluding capital) rather than completed inhouse. The following calculation can be used for this estimate: Contracted Services (External) - Labour / (Wages + Contracted Services (Internal) - Labour + Contracted Services (External) - Labour) or if the split between labour and other contracted services is unknown, the calculation should be Contracted Services (External) - Other / (Wages + Equipment and Materials + Contracted Services (Internal) - Other + Contracted Services (External) - Other). If all O&M work is completed inhouse then enter 0%. If all operations are externally provided by a contracted service then the % will be close to 100%. Most systems will have a percentage between 0% and 100%. Details of the activities that are contracted out should be provided in the Notes field (eg electrical work, emergency repairs, etc).

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

O&M Costs	Pipes O&M cost	Operation & Maintenance cost allocations for the entire distribution system **minus** those relating specifically to pump stations and customer metering. Exclude capital costs. Capital replacements should be recorded under "Capital Investments", and new capital under "New Capital Investment" (note that if minor capital costs cannot be separated out, indicate the $ limit for minor capital in the Notes field). See also definitions for Wages, Equipment and Materials, Contracted Services (Internal), Contracted Services (External), Energy, Staff Training & Other.
	Pump station O&M cost	All Operation & Maintenance cost allocations for **pump station** inventory. If pump station costs cannot be identified, a percent of total system O & M costs can be estimated. Total System O&M cost = Pipes O&M cost + Pump Station O&M cost + Metering O&M cost. Capital replacements should be recorded under "Capital Investments", and new capital under "New Capital Investment" (note that if minor capital costs cannot be separated out, indicate the $ limit for minor capital in the Notes field). See also definitions for Wages, Equipment and Materials, Contracted Services (Internal), Contracted Services (External), Energy, Staff Training & Other.
	Metering O&M cost	All Operations & Maintenance cost allocations for customer meter reading, billing and maintenance. If metering costs cannot be identified, a percent of total system O & M costs can be estimated. Total System O&M cost = Pipes O&M cost + Pump Station O&M cost + Metering O&M cost. Capital replacements should be recorded under "Capital Investements", and new capital under "New Capital Investment" (note that if minor capital costs cannot be separated out, indicate the $ limit for minor capital in the Notes field). See also definitions for Wages, Equipment and Materials, Contracted Services (Internal), Contracted Services (External), Energy, Staff Training & Other. Note, the cost of meter reading should additionally be recorded as a separate item under the catagory and heading "Distribution-Goal 3-Other Costs". Customer billing should also be recorded in this way under the category and heading "Utility-Rates & Financing-Goal 3".
	Total Costs – O&M	Sum of the actual O&M costs incurred in the operation of the distribution/transmission/integrated system (excludes capital costs, indirect costs, transfers to reserves and debt/interest charges). Total System O&M cost = Pipes O&M cost + Pump Station O&M cost + Metering O&M cost. Revenues are only included where they are recoveries for work done by Water Utility staff that is extraneous to the utility (for example, for lab tests for other utilities). *Total O&M should exclude O&M revenues received for treated water supplied to neighbouring regions/municipalities.*
	Wages	Cost of wages for internal operations, maintenance and support staff. Includes regular salaries, overtime, holidays paid sick time, casual wages, fringe benefits and meal allowances. Also includes revenues/recoveries that balance work performed by water utility staff that is extraneous to the water utility (for example, when lab staff perform tests for other utilities). Excludes cost of wages for time worked on capital construction related projects (e.g. hydraulic modeling). Also excludes cost of wages for GIS staff as these are considered under indirect costs as they are IT related. For technical and engineering staff include only the cost of wages for time worked that is directly related to operations and maintenance (e.g. engineers undertaking supervision of pipe inspection work).
	Equipment and Materials (Supplies)	Cost of equipment and materials required for operations, maintenance or support activities and staff. Includes for example courier costs, postage, equipment rentals, repairs (parts), laundry, safety supplies, telephone, uniforms, vehicles, equipment, insurance, and building utility fees for solid waste, garbage and sewer.
	Contracted Services – Internal	Cost of work completed by an internal municipal department that relates to operations, maintenance or support and is charged back to the water utility as a contracted cost. Includes for example charge back for radio equipment and building services such as garbage collection and recycling. Excludes cost of wages for time worked on capital construction related projects (e.g. hydraulic modeling). Also excludes cost of wages for GIS staff as these are considered under indirect costs as they are IT related. For technical and engineering staff include only the cost of wages for time worked that is directly related to operations and maintenance (e.g. engineers undertaking supervision of pipe inspection work).

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Contracted Services - External	Cost of work completed by an external contractor or business that relates to operations, maintenance or support and is charged to the water distribution system as a contracted cost. Includes for example advertising, building repairs, ground maintenance, hauling services, contracted janitorial services, consulting engineering fees related to non-capital work and fleet. Excludes external contracted costs for capital construction related work.
	Energy	Cost of all energy used in the operation and maintenance of the distribution/transmission/integrated system. Energy used at the works yard, offices or vehicle use should only be included under the pipes and total system O&M cost energy fields (not under pump stations). All energy purchase costs should include the direct cost of energy, its delivery, distribution, taxes, surcharges and similar costs.
	Staff Training	Includes association dues, membership fees, publications, conventions, training courses, conferences, travel associated with courses for operations, maintenance and support staff.
	Other	Includes other O&M costs associated with the distribution system such as rent, property taxes, permit fees, utility charges for water, garbage etc.
	Confidence Rating	Rate how confident you are with the values provided. Allocate a rating of 3 down to 1 according to whether your supporting data set is: 3. robust and fully auditable 2. partially anecdotal, often requiring some degree of interpretation 1. anecdotal
Actual Indirect Costs	Charge-Backs	The total cost of all indirect services that the utility paid under the water utility distribution system's budget. Indirect services include Admin, Human Resources, Finance, Customer billing, Insurance, IT (including GIS and other information management systems except for Maintenance Management Systems as these are considered O&M) and any other similar costs that support the utility.
Capital Costs	Capital cost	The costs for capital projects including reinvestment in the existing system and new investment for upgrades and expansions to handle growth. Include both contracted capital work and internal costs associated with capital such as wages for capital engineering staff i.e. design, tendering, studies, etc. Capital projects cover equipment and large maintenance expenditures that cannot be funded through the operating budget.
	New capital investment	A project to expand the system to handle growth and upgrade to a higher level of service. Projects which serve one or more purpose (maintenance and expansion) should be prorated in order to also capture the capital applied for reinvestment activities. Include both contracted capital work and internal costs associated with capital such as wages for capital engineering staff i.e. design, tendering, etc. Includes new capital costs for pipes (including valves, hydrants, reservoirs etc), pump stations and meters.
	Capital reinvestment	A project which substantially maintains the life of the water system. This is intended to be a measure of reinvestment to maintain current facilities and excludes expansion of system to handle growth and upgrading to a higher level of service. Projects which serve one or more purpose (maintenance and expansion) should be prorated in order to also capture the capital applied for investment activities. Include both contracted capital work and internal costs associated with capital such as wages for capital engineering staff i.e. design, tendering, etc. Includes capital reinvestment (i.e. replacement and relining) costs for pipes (including valves, hydrants, reservoirs etc), pump stations and meters.
	Net Change in Capital Reserves	This is the difference between Capital Reserves at December 31st less Capital Reserves at January 1st of the year being benchmarked. Exclude rate stabilization reserves or operating reserves. If the capital reserve is for the full water utility them the net change value should be prorated between the water system and each treatment plant (for example, by replacement value).
	Current Capital Reserves	The total value for the capital reserve at the year end. Includes all reserve funds for future rehabilitation and expansions of the system. Doesn't include rate stabilization reserves or operating reserves. If the capital reserve is for the full water utility, the value should be prorated between the water system and each treatment plant (for e.g. by replacement value).
	Notes, Capital Cost	What is your limit for minor capital that is included under the O&M budget? Do you have separate capital reserves for pipes and treatment? Do you have separate capital reserves for new capital and reinvestment?

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

Other Costs	Cost of Fire hydrant O&M	Annual operations and maintenance costs allocated to fire hydrants (entire hydrant assemblies including hydrant valves). Includes the costs of regular inspections, testing and repairs.
	Cost of meter reading	Total cost of reading customer meters. Include both internal and/or external sub-contractor costs. This value should only include costs directly associated with reading meters. It should not include other maintenance costs, which are recorded in "D-Costs: metering O&M costs". Note that this value must be incorporated into "D-Costs: metering O&M costs"; and, that customer billing costs should be recorded separately under the heading "Utility-Rates & Financing".
	Cost of main break repairs	Cost of main break repairs all inclusive of labour, equipment, overhead and contract costs. Restoration costs such as utility cuts, and paving are also to be included. See also "Unplanned Maintenance" & "# of main breaks".
	Current Year O&M Budget allocation	Approved operations and maintenance budget for the water distribution/transmission/integrated system for the upcoming year (the year of data capture, typically 1 year after the year data is collected for).
	Current Year Capital Reinvestment Budget Allocation	Approved capital reinvestment budget for the distribution/transmission/ integrated system for the upcoming year (the year of data capture, typically 1 year after the year data is collected for).
FTEs	FTE	Full-time equivalent 1 FTE = 2080 hours = 52 x 40 hr week. Therefore, this number is not a measure of effort. It accounts for hours whether worked, taken as vacation or recorded as sick or other leave. Includes both permanent and temporary staff. Contracted FTEs include equivalent FTEs for all staff employed by an outside company.
	Employee FTEs	See also definition of "FTE". Employee FTEs are the full time equivalents of the employees working on the distribution system.
	Contracted FTEs	See also definition of "FTE". Contracted FTEs are employees working on the distribution system that work for an organization external to the City/ Region.
	Field staff	See also definition of "FTE". *Total number of filed* employees who work in the distribution/ transmission system *including pump station staff* and are involved in the day to day operations and maintenance. Includes Pump Station and Metering FTEs. Does not include supervisors, support, or technical/engineering staff. Also referred to as "outside staff".
	Technical/engineering staff	See also definition of "FTE". Engineers, chemists, technician used in the distribution/ transmission system operations. Does not include design and construction staff associated with capital projects.
	Supervisor/support	See also definition of "FTE". Full time equivalent employees in supervision and administration (and dedicated indirect staff such as finance, fleet, customer services etc) which support the distribution/ transmission system and are based at the public works yard.
	Laboratory staff	See also definition of "FTE". Includes the number of FTEs who work in the laboratory providing service to water utility.
	Pump Station	See also definition of "FTE". The full-time equivalent employees for the distribution/ transmission system field staff that work specifically on pump stations (a subset of distribution/transmission system field FTEs).
	Metering field	See also definition of "FTE". The full-time equivalent employees for the distribution/ transmission system field staff that work specifically on metering (a subset of distribution/transmission system field FTEs).
Pump Station Energy	Pump Station Energy Consumption	Sum of all energy consumed (Electricity, natural gas, and diesel) in operating and maintaining pump stations in the distribution/transmission system i.e. electricity or diesel for the pumps, and natural gas for heating. This does NOT include energy consumed in operating vehicles.
	Electricity consumed	Amount of electricity consumed annually while operating and maintaining the plant or the distribution/transmission system pump stations.
	Natural gas consumed	Amount of natural gas in GJ consumed annually while operating and maintaining the system. If data is provided in m^3, then multiply by 0.0373 to convert to GJ.
	Diesel consumed	Amount of diesel consumed annually while operating and maintaining the distribution/transmission system pump stations, excluding diesel used in vehicles.
	Total Energy Consumed	Sum of the energy consumed in kWh in the operation and maintenance of the distribution system pump stations. Energy sources include electricity, natural gas, diesel and steam and are converted to kWh using standard conversions.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Cost of energy purchased	Cost of energy consumed in the distribution system pump stations for each energy source (i.e. excluding reservoirs, PRV stations, valve chambers etc). Energy sources include electricity, natural gas, oil, propane and diesel. All energy purchase costs should include the direct cost of energy, its delivery, distribution, taxes, surcharges and similar costs.
Chemicals	Chemical Consumption costs	All costs for chemicals (including the cost of delivery) used at the pump stations and throughout the distribution system. This excludes chemicals used at the water treatment plant.
	Chemical	Name of the Chemical used at the distribution system. Select the Chemical by scrolling through the drop down box. Additional information on the chemical use is available on the "Chemicals" Tab. If "Other" is selected, please provide what chemicals are being used in the notes field.
	Amount Consumed (Chemicals)	Annual consumption of this chemical in the distribution system. The value should only include the chemicals consumed this year and not the total amount of chemicals purchased.
	Used For (Chemicals)	Describe what the chemical is used for. For example: Chlorine is used for disinfection.
	Annual Cost (Chemicals)	Annual cost for each chemical listed in the table. The value reported should only include the cost for the chemicals consumed this year and not the total cost of chemicals purchased.
	Unit Cost (Chemicals)	Unit cost of each chemical used in the table. Enter only the $ value in this column, enter the unit value in the column to the right.
	Unit	See Unit Cost (Chemicals). This column is only for the unit value.
	Total Chemical Costs	(ca) Human Resources
Maintenance Planning	Total maintenance hours	= Preventative maintenance hours + Planned (scheduled) hours + Unplanned (breakdown) hours + Other hours. Include both internal and external maintenance hours (eg some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external).
	Preventative maintenance hours	Preventative maintenance hours = # of hours spent on regularly scheduled and periodic maintenance as directed by vendor (time spent preventing equipment breaking down as specified by the vendor). Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external).
	Planned maintenance hours	Planned (scheduled) hours = # of hours spent by maintenance staff on routine maintenance tasks that are identified through observation, etc (time spent maintaining equipment after it is observed that the equipment is at risk of breaking down). Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external).
	Unplanned maintenance hours	Unplanned (breakdown) hours = # of hours spent by maintenance staff on high and low emergency work (time spent repairing equipment after it has broken down). High emergency work covers breakdowns that may result in loss of service or other severe detriment to the utility (e.g.; spill, etc.), maintenance must be deployed as soon as possible. Low emergency work covers breakdowns which may not result in loss of service or are protected by equipment redundancy, maintenance shall be deployed as the earliest convenience. Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external).
	Other maintenance hours	Other hours = # of hours spent by maintenance staff on minor, low priority tasks that can be assigned during slow periods and any work that does not fit into the other maintenance work categories (time spent on fill in maintenance work). Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external).
	Notes, Maintenance Planning	How is the number of emergency maintenance hours recorded? Is it recorded on the Maintenance Management System? Is the number of overtime hours used as an estimate for emergency work? Is there emergency work performed by external contractors that is not recorded nor included in the number of emergency maintenance hours? Is emergency work performed entirely by external contractors?
D-PUBLIC HEALTH AND SAFETY		
Water Regulations	Guideline for Canadian Drinking Water Quality	Yes/no answer is required with further explanation to be placed in the notes field.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Provincial Guidelines/ Regulations	Yes/no answer is required with further explanation to be placed in the notes field. For example Ontario drinking water act, regulation 459/00, and Fisheries Act.
	EPA Guidelines/ Regulations	Yes/no answer is required with further explanation to be placed in the notes field.
	Other Guidelines/ Regulations	Yes/no answer is required with further explanation to be placed in the notes field.
	Have water quality regulations changed during year?	Yes/no answer is required with further explanation of how the regulations have changed to be provided in the notes field.
High Quality Water	Turbidity	Enter values for the plant target, the minimum value, the maximum value and the average value and the number of days with an occurrence over the group target (see definitions for these terms below). Turbidity is a measure of suspended material in the water.
	Total coli	Enter the number of days with positive occurrences of Total coliform in samples tested (if the sample has to retest positive before being considered as a positive sample then only include these). The concentration of coliform organisms, the total coliform group includes four genera in the Enterobacteriaceae family, including; Escherichia, Klevisella, Citrobactor and Enterobacter.
	Faecal coli	Enter the number of days with positive occurrences of Faecal coliform in samples tested (if the sample has to retest positive before being considered as a positive sample then only include these). Faecal coliforms are bacteria associated with human or animal wastes.
	E.coli	Enter the number of days with positive occurrences of E. coli in samples tested (if the sample has to retest positive before being considered as a positive sample then only include these). E. Coli, is a fecal coliform bacteria that is an indication of sewage or animal waste contamination.
	THMs	Enter values for the plant target, the average value and the number of days with an occurrence over the group target (see definitions for these terms below). Trihalomethanes are a chlorination disinfection by-product produced when chlorine reacts with residual organic compounds.
	Bromodichloromethane	Enter values for the plant target, the minimum value, the maximum value and the average value and the number of days with an occurrence over the group target (see definitions for these terms below). Bromodichloromehtan is a component of trihalomethanes which are a chlorination disinfection by-product produced when chlorine reacts with residual organic compounds.
	HAAs	Enter values for the plant target, the average value and the number of days with an occurrence over the group target (see definitions for these terms below). Haloacetic Acids are a chlorination disinfection by-product.
	Group target for high quality water parameters	A theoretical target for treated water for each of the selected water quality parameters that will be used by the benchmarking participants as an indicator of whether high quality water is being produced. The targets are based on a comparison of both the Canadian Drinking Water Guidelines and the USEPA regulations and are expressed as limits (e.g. the group target for Faecal coliforms is <1 /100mL which is the minimum detectable limit).
	System target for high quality water parameters	The actual target value for treated water used by the individual utility for each of the selected water quality parameters. Collect separately for treatment plants and distribution/transmission systems.
	Average Value for high quality water parameters	The average value for each of the selected water quality parameters based on all treated water quality samples. Collect separately for treatment plants and distribution/ transmission systems.
	# of occurrences over group target for high quality water parameters	The number of days with an occurrence during the year where treated water quality samples from the transmission/distribution system showed values higher than the group target (for each of the selected water quality parameters).
Testing for High Water Quality	Do you test for this parameter?	Yes/no answer is required for both parameters, THMs and HAAs, with further explanation to be provided in the notes field.
	Is the testing voluntary?	Yes/no answer is required for both parameters, THMs and HAAs, with further explanation to be provided in the notes field.
	Is the testing mandatory?	Yes/no answer is required for both parameters, THMs and HAAs, with further explanation to be provided in the notes field.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

Maintenance	Length of system cleaned *(single pass)*	This is the length of main cleaned on at least one occasion during the year using flushing, swabbing and/or pigging methods to remove biofilms, sediment, and corrosion by-products from water main interiors. This generally improves water quality and hydraulic capacity. Do NOT double count mains that are cleaned on two or more occasions. Excludes service connections and mains cleaned before cement lining. Excludes lengths that are spot flushed for the purpose of retaining a chlorine residual.
	Length of main cleaned by swabbing (single pass)	*A non-aggressive method of cleaning water mains by flushing then cleaning with a foam swab. See also "Length of system cleaned (single pass)".*
	Length of main cleaned by flushing (uni-directional flushing) (single pass)	*The systematic release of water through the mains in the distribution system by sequentially opening fire hydrants and flushing water in a unidirectional manner, where a flow velocity of 1.5-2.m/s is achieved. Flushing removes sediments that may accumulate in water mains and enhances circulation in the distribution system. Excludes service connections and mains cleaned before cement lining. Excludes lengths that are spot flushed for the purpose of retaining a chlorine residual. See also "Length of system cleaned (single pass)".*
	Length of main cleaned by pigging (single pass)	*A pig is a device that moves through the inside of a pipeline for the purpose of cleaning, dimensioning, or inspecting". See also "Length of system cleaned (single pass)".*
	Total Length of Main that can be Cleaned	The length of main that can be cleaned. Can be calculated by taking the total length of water mains, and subtracting the length of main where it is impossible to clean, if any.
	Cumulative Total Length of Main Cleaned	The total cumulative length of water mains cleaned using flushing, swabbing and/or pigging methods to remove biofilms, sediment, and corrosion by-products from water main interiors. This generally improves water quality and hydraulic capacity. Excludes service connections and mains cleaned before cement lining, or flushing to increase demand/chlorine residual. Excludes lengths that are spot flushed for the purpose of retaining a chlorine residual.
	Cumulative length of main cleaned by swabbing	A non-aggressive method of cleaning water mains by flushing then cleaning with a foam swab. See also "Cumulative total Length of main cleaned".
	Cumulative length of main cleaned by flushing (uni-directional flushing)	The systematic release of water through the mains in the distribution system by sequentially opening fire hydrants and flushing water in a unidirectional manner, where a flow velocity of 1.5-2.m/s is achieved. Flushing removes sediments that may accumulate in water mains and enhances circulation in the distribution system. Excludes service connections and mains cleaned before cement lining. Excludes lengths that are spot flushed for the purpose of retaining a chlorine residual. See also "Cumulative total Length of main cleaned".
	Cumulative length of main cleaned by pigging	A pig is a device that moves through the inside of a pipeline for the purpose of cleaning, dimensioning, or inspecting". See also "Cumulative total Length of main cleaned".
	Unit Cost of Swabbing	Unit cost for swabbing water mains in $/km all inclusive of labour, equipment, vehicles, contract costs etc.
	Unit Cost of Flushing	Unit cost for flushing water mains in $/km all inclusive of labour, equipment, vehicles, contract costs etc.
	Unit Cost of Pigging	Unit cost for pigging water mains in $/km all inclusive of labour, equipment, vehicles, contract costs etc.
	# of Storage Reservoirs Cleaned	Number of storage reservoirs cleaned this year. Storage reservoirs include in ground and aboveground reservoirs and elevated tanks.
	Length of main in problem areas	The length of the entire system that is in a problem area. A problem area can be defined as a part of the system that requires additional attention (cleaning/odour control) to maintain proper distribution system function.
	Cumulative length cleaned in problem areas	Of the length of main in problem areas indicated above, complete the cumulative length cleaned of the system that is located in the problem area. A problem area can be defined as a part of the system that requires additional attention (cleaning/odour control) to maintain proper distribution system function.
	Target service level for cleaning: non-problem areas	The target level of cleaning per year for the non-problem areas of the system. For example if the target is to clean every pipe once every two years, the target is 0.5 (1 divided by 2), if the target is to clean all pipes 3 times a year then the target level is 3 Unit is in percentage of length.
	Target service level for cleaning: problem areas	If target service levels are higher for problem areas, state service level as per definition above. Unit is in percentage of length

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

Maintaining High Water Quality	Length of main spot flushed	Length of system that undergoes spot flushing at dead ends or other locations in response to *or for prevention of* low chlorine residuals, failed bacteriological test, or customer complaints. Add the length of mains that receive multiple flushes, NOT the cumulative length of mains flushed (i.e. do not multiply main length by the number of flushes that it receives). Actual, cumulative, length of flushes is calculated below.
	Total cumulative length of main that undergoes spot flushing	Total cumulative length of system that undergoes spot flushing at dead ends or other locations in response to *or for prevention of* low chlorine residuals, failed bacteriological test, or customer complaints. The total cumulative length includes all lengths of main that receive spot flushing multiplied by the number of times each main was flushed in a year. For example, if 5 km of mains are flushed weekly to maintain a chlorine residual, the total cumulative length flushed = 5km * 52 weeks = 260 km.
CCC Program	Do you have a Cross-Connection Control Program?	Cross connections are any (actual or potential) connections or structural arrangements between a potable water system and any other water source or system through which backflow of any non potable water or other substance can occur. A cross connection control program ensures that no backflow occurs through cross connections by inspecting installations, ensuring compliance with regulations, setting standards for backflow prevention devices etc.
	Cost of Cross-Connection Control Program	Costs for administering maintaining, and enforcing a cross-connection control program, including personnel, equipment and materials.
	# of FTEs Administering the Cross-Connection Control Program	See also definition of "FTE". # of Full Time Equivalent (FTE) employees involved in the day to day administration, maintenance, and enforcement of the Cross-
Security	Have you undertaken a security audit of your system?	Yes/no answer is required with further explanation to be placed in the notes field.
	Do you limit hydrant usage?	Yes/no answer is required with further explanation to be placed in the notes field.
	Do you have emergency procedures for security breaches?	Yes/no answer is required with further explanation to be placed in the notes field.
D-SAFE AND PRODUCTIVE		
Labour Issues	# of accidents with lost time	Number of accidents, which caused the worker to incur time off work. Exclude accidents incurred during capital construction.
	# of lost hours due to accidents	Total number of hours that field staff were not at work due to accidents. Exclude accidents incurred during capital construction.
	# of sick days allowed per field employee	This is the number of sick days allowed for field employees as stated in the collective bargaining agreement for the union. This number only includes the number of days before pay is reduced or long term disability is in effect. This number may be different for each labour category, however the average should be calculated.
	# of sick days taken per field employee	Average number of sick days taken per field employee, including days taken because of sick kids or sick spouses. Excludes long term disability and any time paid by WCB. Also record total # of sick hours taken for field employees for use in the availability calculations.
	# of safety training hours per employee	Average number of safety training hours per field employee.
	Is *any of your* capital construction completed in-house?	Answer "Yes" if capital construction is completed by in-house staff. There may be a link between accident frequency and the level of capital construction work that the field staff are involved in.
	% of capital construction work completed in-house	Estimate the percentage of capital construction work that is completed by in-house crews rather than externally contracted (as a percentage of total capital construction work).
Availability	Total # of safety training hours for actual employees	The total number of safety training hours taken for all field staff employees that includes confined space entry, safety meetings, hazardous chemical training, WHMIS etc. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of other training hours per employee	The total number of other training hours taken for all field staff employees that excludes safety training hours but includes conferences, seminars etc. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of sick hours taken for actual employees	The total number of sick hours taken by field staff employees. Equals the number of average # of sick days taken per employee * # of employees * 8 hours per day. Actual employees refers to the number of field FTEs as entered in the section previous.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Total # of long term leave hours taken for actual employees	The total number of long term leave hours for all field staff employees which is additional to sick days taken. Includes long term leave when staff are not replaced and hours paid by the Workplace Safety and Insurance Board or the Workers Compensation Board. If the employee was on WCB for the full year, then their long term leave hours should not be included. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of vacation hours for actual employees	The total number of vacation hours taken by field staff employees that includes annual leave, maternity or paternity leave, leave without pay and statutory holidays. If the employee was on maternity or paternity leave for the full year, then their hours should not be included. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of union paid hours for actual employees	Total # of union paid hours for actual employees. The total number of hours that field staff employees were unavailable for work due to union duties (and their time was paid for by the union) for example to attend union meetings. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total paid hours for actual employees	Total number of standard paid hours recorded for all field staff excluding overtime hours. If total is unknown, it can be calculated by "# of actual field staff x average # of paid hours per field staff per year" where average # of paid hours per field staff per year is typically 2080 hours. Exclude hours for field staff that are on WCB, maternity leave or paternity leave for the full year.
	Total available hours for actual employees	= Total paid hours – Total unavailable hours. Where total unavailable hours = vacation hours + optional training hours + safety training hours + sick hours + long term leave hours + union paid hours.
	Total overtime hours	Total number of overtime hours recorded for all field staff; do not include overtime hours that are paid in lieu, or that are accrued from working a normal shift on a statutory holiday. If actual hours are not available, calculate as "# of actual field staff x average number of recorded overtime hours per field staff per year less any hours previously described".
	Cost of overtime hours	This is the total cost of overtime hours recorded in the above box. Use actual cost of overtime hours where possible, or an approximate cost such as: total overtime hours x average cost per overtime hour.
Retirement	# of field employees in age bracket ##-##	Number of field staff employees that are within the given age bracket in the current year when the data sheets are being completed.
	What is the typical retirement age for field staff?	The objective of the question is to identify a potential staffing crunch due to retirement of field staff in the upcoming 5 to 10 years.
	# of field staff eligible to retire in X to X years	The calculations for these measures are based on assuming that staff are eligible to retire after either Y years of service or Z years old, whichever condition comes first. To report the number of staff that are eligible to retire in X years, you need to calculate for each field staff their age (z), years of service (y) and number of years until eligible for retirement (x). Where number of years until eligible for retirement can be calculated as follows: if Z > z then x = (Y - y) unless (z + (Y-y)) > Z then x = Z - z If z > Z then x = 0 For example, if Y = 30 and Z = 65 and Joe is 57 and has 10 years of service then he is eligible to retire after 8 years (65-57) because (57 + (30-10)) > 65. See also the Retirement template in the online Data Collection Resource Kit for calculations. This data should be provided based on the current year when the data sheets are being completed.
D-SATISFIED AND INFORMED CUSTOMERS		
Target Response Times	Emergencies occurring during working hours	When a site visit is made in response to a call that is received during working hours for an emergency, what is the target maximum amount of time between receiving the call and the O&M crew being on-site to undertake the preliminary assessment (not necessarily complete the full repair etc)?
	Emergencies occurring after working hours	When a site visit is made in response to a call that is received after working hours for an emergency, what is the target maximum amount of time between receiving the call and the O&M crew being on-site to undertake the preliminary assessment (not necessarily complete the full repair etc)?
	Non-emergencies occurring during working hours	When a site visit is made in response to a call that is received during working hours for a non-emergency, what is the target maximum amount of time between receiving the call and the O&M crew being on-site to undertake the preliminary
	Non-emergencies occurring after working hours	When a site visit is made in response to a call that is received after working hours for a non-emergency, what is the target maximum amount of time between receiving the call and the O&M crew being on-site to undertake the preliminary assessment (not necessarily complete the full repair etc)?

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

Customer Service	*What is the maximum Municipal target for residential pressure?*	*Maximum target value set by the municipality for residential pressure (kPa) within the distribution system.*
	What is the minimum Municipal target for residential pressure?	*Minimum target value set by the municipality for residential pressure (kPa) within the distribution system.*
	What is the maximum Municipal target for residential flow?	*Maximum target values set by the municipality for residential flow (L/s) within the distribution system.*
	What is the minimum Municipal target for residential flow?	*Minimum target values set by the municipality for residential flow (L/s) within the distribution system.*
	# of water pressure complaints	# of customer complaints received at the customer service centre that were related to water pressure in the distribution system. Should be a sum of complaints regarding high and low water pressure. Note: A complaint will typically require follow-up action and should exclude general inquiries.
	# of High Water Pressure Complaints	# of customer complaints received at the customer service centre that were related to high water pressure in the distribution system.
	# of Low Water Pressure Complaints	# of customer complaints received at the customer service centre that were related to low water pressure in the distribution system.
	# of customer days without service	Sum of (# of service connections affected by any service interruption X # of hours affected / 24 hours) for each service interruption occurrence. Distribution systems only.
D-PROTECT THE ENVIRONMENT		
Leak Detection Program	Do you have a leak detection program in place?	A leakage program aims to reduce the percentage of water loss by locating unknown leaks. Methods of locating unknown leaks include listening surveys and flow measurement surveys.
	Is the leak detection program ongoing?	A leakage program aims to reduce the percentage of water loss by locating unknown leaks. Methods of locating unknown leaks include listening surveys and flow measurement surveys.
	Length tested for leakage	Length of mains that were tested for leakage during the year using listening surveys or flow measurement surveys. Collect separately the breakdown of length tested using the three different methods noted, i.e. ultrasonic, flow tests and night flow monitoring.
	Length tested for leakage using acoustic methods	See "Length tested for leakage." Length tested for leakage using methods to listen for leakage sounds on main fittings or in the ground, including listening sticks, leak-noise correlators, geophones and noise loggers.
	Length tested for leakage through flow testing	See "Length tested for leakage." Length tested for leakage through methods such as step testing, night flow monitoring and district metered areas.
	Length tested for leakage through visual methods	See "Length tested for leakage." Length tested for leakage through visual methods such as visually surveying mains, hydrants and valves, or methods such as thermal imaging or tracer tests.
	Cost of leak detection program	Annual cost of leak detection program including work done in-house and by external contractors.
	Response time for main breaks	Average number of hours between the complaint call and the time staff are mobilized to fix the break.
Infrastructure Leakage Index	Have you completed the water audit spreadsheet?	This is a Yes/No question relating to the additional process benchmarking module for water loss, the AWWA Water Loss Control Committee Water Audit Spreadsheet. All data fields (and associated definitions) below refer to data that is collected and calculated in the Water Audit Spreadsheet. Please complete the Water Audit Spreadsheet separately (for a greater understanding of the methodology) and then fill in the relevant numbers below.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Billed authorized consumption (metered & unmetered)	This cell is linked to the D-Description tab and is a sum of the cells ."Volume delivered to residential customers : multi-family", "Volume delivered to residential customers : single family" & "Volume delivered to ICI customers". It represents the sum of all billed consumption from both metered and unmetered sources. The billed metered consumption includes all groups of customers such as domestic, commercial, industrial or institutional. The billed unmetered consumption includes all billed consumption which is calculated based on estimates or norms but is not metered. This might be a very small component in fully metered systems (for example billing based on estimates for the period a customer meter is out of order) but will be the key consumption component in systems without universal metering.
	Total non-revenue water volume	Quantity of water that does not provide any revenue to the utility. NRW= Total volume delivered from the treatment plants – Billed authorized consumption. The data for this field is sourced directly from D-Description so please complete that section first.
	Unbilled metered volume	Metered Consumption which is for any reason unbilled. This might for example include metered consumption of the utility itself or water provided to institutions free of charge.
	Unbilled unmetered volume	Any kind of Authorized Consumption which is neither billed nor metered. This component typically includes items such as fire fighting, flushing of mains and sewers, street cleaning, frost protection, etc. In a well run utility it is a small
	Unauthorized consumption volume	Theft or illegal uses
	Customer metering volume inaccuracies	Meter under-registration and data handling errors. Includes all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing). Note: Over-registration of customer meters, leads to under-estimation of Real Losses. Under-registration of customer meters, leads to over-estimation of Real Losses.
	Apparent losses volume	= unauthorized consumption + meter under-registration + data handling errors Includes all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing), plus unauthorized consumption (theft or illegal use). NOTE: Over-registration of customer meters, leads to under-estimation of Real Losses. Under-registration of customer meters, leads to over-estimation of Real Losses.
	Real losses volume	Physical water losses from the pressurized system and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows. May also be called leakage.
	Average length of private pipe	This is the average distance in metres between the curbstop and the customer meter, or from the curbstop to the building line (first point of customer consumption) if customers are unmetered.
	Average operating pressure	The average pressure (in metres of head) may be approximated when compiling the preliminary water audit. Once routine water auditing has been established, a more accurate assessment of average pressure should be pursued. If the water utility infrastructure is recorded in a Geographical Information System (GIS) the average pressure at many locations in the distribution system can be readily obtained. If a GIS does not exist, a weighted average of pressure data can be calculated from water pressure measured at various fire hydrants scattered across the water distribution system.
	# of inactive service connections	Number of distinct service connections, main to curb stop, that are inactive and not included in the numbers of service connections provided in the Distribution Description tab. This may differ substantially from the number of inactive Customers.

WATER DISTRIBUTION

Distribution/ Transmission Definitions by Hyperlinks

	Unavoidable Annual Real Losses (UARL)	The UARL is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a key variable in the calculation of the Infrastructure Leakage Index (ILI). It is not necessary that water utilities set this level as the target level of leakage, unless water is unusually expensive, scarce or both. UARL (litres/day)=(18.0Lm + 0.8Nc + 25.0Lp) xP where: Lm = length of mains (kilometres) Nc = number of service connections Lp = total length of private pipe (kilometres) = Nc x average distance of private pipe in m/1000 P = average operating pressure in metres of head
	Infrastructure Leakage Index (ILI)	The ratio of the Current Annual Real Losses (Real Losses) to the Unavoidable Annual Real Losses (UARL). The ILI is a highly effective performance indicator for comparing the performance of utilities in operational management of real losses.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

T-DESCRIPTION		
Volume Conveyed	Population served	This includes the population of all wholesale and retail customers, *excluding ICI equivalents and population equivalents for treated water supplied to neighbouring regions/municipalities*. Collect both design and current population served for the treatment plant. *Note that this number may well be different to the City's recorded population and, where possible, should estimate the typical number of residents receiving service.*
	Average day demand	*Water demanded by the distribution system, which is less than the total amount of raw water entering the plant (units used are ML/day). Collect both design and current average day demand for the treatment plant. Average Day Demand = Total Annual Treated Water (ML) / 365 days (Include treated water volume supplied to neighbouring regions/municipalities)*
	Maximum day demand	Maximum volume per day flowing through the plant for any day in the year (units used are ML/day). Collect both design and current maximum day demand for the treatment plant. *(Include treated water volume supplied to neighbouring regions/municipalities)*
	Peak hour demand	Maximum volume flowing through the plant for any hour in the year (units used are ML/day). Collect both design and current peak hour demand for the treatment plant. *(Include treated water volume supplied to neighbouring regions/municipalities)*
	Rated (installed) capacity	The design rated capacity is that specified by the design engineer. The current rated capacity is that which the plant operators know that the plant can actually achieve (may be higher or lower than the design rated capacity).
	Total raw water abstracted	Annual volume of raw water delivered from the source to the treatment plant. *(Include raw water abstracted required for supplying treated water volume to neighbouring regions/municipalities)*
	Total treated water	Annual volume of treated water delivered from the treatment plant to the transmission/distribution system. *(Include treated water volume supplied to neighbouring regions/municipalities)*
Source Category	% of volume supplied	Percentage of raw water supplied to the treatment plant that is sourced from surface water or ground water. For multiple surface water sources (or groundwater sources) the % of volume supplied for all the surface water sources (or groundwater sources) should be recorded.
Surface Water	# of surface water sources	# of surface water sources either river or lake for the water treatment plant under consideration
	1:50 year reliable yield	The minimum yield of the water source based on a drought with a fifty year return period (ML/day). Collect separately for surface water source and groundwater source. If there are multiple surface water sources (or groundwater sources) for one plant the total 1:50 year reliable yield for all surface water sources (or groundwater sources) should be recorded.
	Water license existing maximum capacity	Existing maximum capacity of the water license, measured in daily flow (ML/day). If the capacity is provided in annual volume (ML), then divide by 365 days to provide the value in ML/day. For multiple surface water sources (or groundwater sources), the total capacity for all surface water sources (or groundwater sources) should be recorded.
	Water license potential maximum capacity	Potential maximum capacity that the water license may be extended to in the future, measured in daily flow (ML/day). If the capacity is provided in annual volume (ML), then divide by 365 days to provide the value in ML/day. For multiple surface water sources (or groundwater sources) the total capacity for all surface water sources (or groundwater sources) should be recorded.
Surface Water Protection	Is the source watershed protected?	Yes/no answer is required with further explanation to be placed in the notes field. Where the watershed of the surface water source is protected by a Watershed Protection plan to prevent contamination (typically includes prohibition of public access to the catchment area). Describe in the Notes field the O&M activities that are undertaken by field staff for the watershed protection program, for example, clearing of invasive plant species, patrolling of watershed.
	Combined catchment area	Total catchment area of all protected watersheds that supply water to the treatment plant or system.
	Number of reservoirs (dams)	Number of all reservoirs within the protected watersheds that supply water to the treatment plant or system.
	Combined capacity of reservoirs	Total capacity of all reservoirs within the protected watersheds that supply water to the treatment plant or system.
Groundwater	# of wells	Number of groundwater wells.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

Source	Is the aquifer confined?	A water bearing geologic formation that is protected from sub surface contamination by an impermeable geologic layer such as clay or granite.
	Are aquifer levels declining?	Yes/no answer is required with further explanation to be placed in the notes field.
	Decline in aquifer level from previous year	If the aquifer is declining, how many meters has the aquifer declined from the previous year?
Groundwater Source Protection	How often do you conduct well drawdown tests (pumping tests)?	Number of times a drawdown tests was conducted this year. Drawdown tests are required to secure data regarding well efficiency and drawdown rate while pumping continuously. Units in # of times per month.
	Do you have a wellhead protection plan?	Yes/no answer is required with further explanation to be placed in the notes field. Wellhead protection plan is the pollution prevention and management program used to protect underground sources of drinking water.
	Do you have control over the groundwater regeneration area?	Yes/no answer is required with further explanation to be placed in the notes field. To ensure that the groundwater regeneration area is not contaminated. Is there a plan in place to protect the groundwater? Is there any monitoring to prevent contamination etc?
	Have you completed a hydrogeologic study?	Yes/no answer is required with further explanation to be placed in the notes field. The hydrogeological study is conducted to ascertain the movement and quality of water beneath Earth's surface.
	In months, when was the hydrogeologic study last updated?	Record the number of months the last hydrogeologic study was updated counting back from December 2006.
	Are there any well construction records in place?	Yes/no answer is required with further explanation to be placed in the notes field.
Groundwater Well Pumps	Total # of pumps (well pumps)	Total number of well pumps.
	Total # of pump stations	Total number of well pump stations.
	# of pump stations with "specified range of" Hp	Add the number of pump stations for each range of horsepower. For example a pump station with 2x20 Hp duty pumps, and a single 20 Hp standby pump has a combined rating of 60 Hp, and will be tallied in the "51 - 100 Hp" range.
	Total Hp for all well pumps	The combined horsepower rating for all pumps in the pump stations, including all standby pumps.
	Total flow capacity for all well pumps	The total combined capacity (l/s) of all pumps in each pump station. This includes the capacity of all stand-by pumps.
Raw Water Characteristics	Turbidity of raw water	Enter both the annual maximum and average of raw water turbidity supplied to the treatment plant (measure in nephelometric turbidity units, NTU). Daily raw water averages. A measure of the presence of suspended matter or particles in the water.
	Colour of raw water	Enter both the annual maximum and average of colour of the raw water supplied to the treatment plant (measure in true colour units, TCU).
	Alkalinity of raw water	Enter both the annual maximum and average concentration of alkalinity in the raw water supplied to the treatment plant (measured in mg/L). A measure of the capacity of the water to resist changes in pH that can occur during the treatment process.
	pH of raw water	Enter both the annual maximum and average of the raw water pH supplied to the treatment plant. A measure of the water's acidity or alkalinity.
	Hardness of raw water	Enter both the annual maximum and average of hardness of the raw water supplied to the treatment plant (measured in mg/L of calcium carbonate).
	Iron of raw water	Enter both the annual maximum and average of iron concentration in the raw water supplied to the treatment plant (measured in mg/L).
	Manganese of raw water	Enter both the annual maximum and average of manganese concentration in the raw water supplied to the treatment plant (measured in mg/L).
	Nitrate-nitrogen of raw water	Enter both the annual maximum and average concentrations of Nitrate-nitrogen in raw water supplied to the treatment plant (measured as mg/L of Nitrate-nitrogen).
	Total organic carbon of raw water	Enter both the annual maximum and average of TOC concentration in the raw water supplied to the treatment plant (measured in mg/L).
	Dissolved organic carbon of raw water	Enter both the annual maximum and average of dissolved organic carbon in the raw water supplied to the treatment plant (measured in mg/L).
	Arsenic of raw water	Enter both the annual maximum and average of Arsenic concentration in the raw water supplied to the treatment plant (measured in mg/L).
	E.coli of raw water	Annual E.coli-positive incidences/samples in the treated water.
	Total coliforms of raw water	Annual total coli-positive incidences in the treated water.
	Notes, Raw Water Characteristics & Ability of Plant to Process all Water Quality Conditions	Provide details on raw water quality characteristics and the ability of the treatment processes in the plant to treat all raw water quality conditions encountered during the year.
Raw Water Turbidity	# of days that raw water turbidity was 0 < x < Y NTU	# of days that raw water turbidity value was between the indicated values.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

Chlorine and Fluoride	Average chlorine dose - primary disinfection	Annual average of chlorine in mg/L (as Cl2) supplied to the primary treatment plant.
	Average chlorine dose - secondary disinfection	Annual average of chlorine in mg/L (as Cl2) supplied to the secondary treatment plant.
	Average free chlorine residual	Annual average of free chlorine residual in the treated water in mg/L.
	Average total chlorine residual	Annual average of total chlorine residual in the treated water in mg/L.
	Average fluoride dose	Annual average of fluoride dose supplied to the raw water in mg/L.
	Average fluoride residual	Annual average of fluoride residual in the treated water in mg/L.
Age	Original construction date	Date of first construction of the plant i.e. the oldest structure on site.
Treatment Plant Category	Disinfection only	Yes/no answer is required for surface water treatment plants, and/or the number of wells applicable for well systems with further explanation to be placed in the notes field. The purpose of the disinfection process is to kill or inactivate the growing forms of pathogenic micro-organisms through the use of chemicals (chlorine, pre-treatment and chlorine dioxide), ozone or ultraviolet radiation.
	Iron and Manganese Removal	Yes/no answer is required for surface water treatment plants, and/or the number of wells applicable for well systems with further explanation to be placed in the notes field. Removal of iron and manganese through filtration such as greensand filtration.
	Iron and Manganese Sequestration	Yes/no answer is required for surface water treatment plants, and/or the number of wells applicable for well systems with further explanation to be placed in the notes field. Prevention of iron and manganese precipitation with the addition of chemicals such as sodium silicate.
	Conventional filtration	Yes/no answer is required for surface water treatment plants, and/or the number of wells applicable for well systems with further explanation to be placed in the notes field. A conventional filtration plant has three key pre-treatment stages prior to filtration: coagulation, flocculation and clarification (also called sedimentation).
	Direct filtration (no clarification)	Yes/no answer is required for surface water treatment plants, and/or the number of wells applicable for well systems with further explanation to be placed in the notes field. A direct filtration plant has only two key pre-treatment stages prior to filtration: coagulation and flocculation. The clarification stage is omitted from the process.
	Membrane filtration	Yes/no answer is required for surface water treatment plants, and/or the number of wells applicable for well systems with further explanation to be placed in the notes field. Membrane filtration plants (also called ultrafiltration plants) utilize a synthetic fibre membrane technology. Membrane filtration plants remove smaller particle sizes than conventional filtration plants, particularly Giardia and Cryptosporidium cysts.
Treatment Plant Classification	Plant Classification	The Classification given to the treatment plant by the Provincial Regulatory Agency - Class I, Class II, Class III, Class IV (note there may be differences in classification between the provinces). Be specific of the definition of this class category in the notes fields following the data fields.
Treatment Details	Is the Treatment Plant Detailed Description the same as the previous year's?	Please complete the Yes/No field for whether the Treatment Plant Detailed Description is the same as the previous year's. If the answer is "Yes", then skip to T-Description 11. (the database will be updated with the previous year's Treatment Plant Detailed Description). If the answer is "No", then complete the Treatment Plant Detailed Description fields (if some of the fields are the same as the previous year's, then note this as "Same as previous year" also if there are only minor changes, please note this, for example under 8 Chemicals "Same as previous year, except added fluoridation").
	Raw Water Intake	Yes/no answer is required with further explanation to be placed in the notes field. The raw water intake withdraws raw water from the source. Types of surface water intake structures include surface diversions, submerged intakes, pump intakes and infiltration galleries. Raw water pumps transfer raw water to a treatment plant process. These pumps are considered part of the treatment plant not the distribution system even if they aren't located on the treatment plant site, for e.g. groundwater pumps. Provide details of infrastructure and pump horsepower.
	Pretreatment technology - Coagulation	Yes/no answer is required with further explanation to be placed in the notes field. A description of the coagulation process within the treatment plant where coagulation is defined as the addition of a coagulant to destabilize the charge on colloids and suspended solids, including bacteria and viruses.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

	Pretreatment technology - Flocculation	Yes/no answer is required with further explanation to be placed in the notes field. A description of the flocculation process within the treatment plant where flocculation is defined as the gentle mixing phase that follows the rapid dispersion of coagulant by the flash mixing unit.
	Pretreatment technology - Clarification	Yes/no answer is required with further explanation to be placed in the notes field. The third stage of the treatment process after coagulation and flocculation. Clarification, also known as settling and sedimentation, is the separation of a suspension into a clarified fluid and a more concentrated suspension. Typically includes grit chambers and sedimentation tanks (clarifiers).
	Filtration technology	Yes/no answer is required with further explanation to be placed in the notes field. A description of the filtration process within the treatment plant where filtration is defined as the fundamental system that removes particulate matter in a water treatment process.
	Primary Disinfection Technology	Yes/no answer is required with further explanation to be placed in the notes field. Disinfection at the beginning of the treatment process.
	Secondary Disinfection Technology	Yes/no answer is required with further explanation to be placed in the notes field. Disinfection at the end of the treatment process.
	Chemicals	Yes/no answer is required with further explanation to be placed in the notes field.
	Residuals Management	Yes/no answer is required with further explanation to be placed in the notes field. Treatment and disposal of residuals, typically includes conditioning, thickening and dewatering.
	Treated Water Pumping	Yes/no answer is required with further description to be placed in the notes field of the treated water pumping technology.
	High Lift Pumps Total Horsepower	Total Horsepower for all pumps within the treatment plant that pump treated water into the distribution system (including standby pumps).
	Head Pressure for High Lift Pumps	The head-pressure for the high lift pump(s) in metres. The high lift pumps within the treatment plant are those that pump treated water into the distribution system.
T-RELIABILITY		
Reliability	% of uninterrupted supply	% of hours in the year that the treatment plant is able to meet the demand.
	# of unplanned hours that plant could not operate at rated capacity	# of hours that the plant cannot operate at its rated capacity (maximum day demand) that were not planned for.
Replacement Value	Total replacement value of treatment plant	The amount of money needed to replace all existing infrastructure used for raw water treatment; include costs relating to surface water abstraction, surface water storage reservoirs, pumping facilities and related infrastructure - do not include costs for groundwater infrastructure (see below). The replacement value shall include all engineering costs, construction, supervision, taxes, etc (excluding land purchasing). Total value for each type of infrastructure is calculated by multiplying the unit value by the number of units (where appropriate). Unit replacement values shall be estimated based on average construction costs over the last 5 years. For example, if 20 main replacements have been constructed over the last five years, the average unit cost per km of main can be estimated from all 20 construction projects (excluding inflation).
	Total replacement value of groundwater wells	The amount of money needed to replace all of the existing infrastructure associated with the groundwater wells. The replacement value shall include all engineering and construction costs for development of the wells and associated electrical and mechanical components (for example well pumps and controls) and structures (but excluding land purchasing).
	Confidence Rating	Rate how confident you are with the values provided. Allocate a rating of 3 down to 1 according to whether your supporting data set is: 3. robust and fully auditable 2. partially anecdotal, often requiring some degree of interpretation 1. anecdotal
Filter Performance	Filter Backwash Frequency	Average number of filter washes per day per filter. For example if there are 4 filters and 1 filter is backwashed per day, the average number of filter washes per day is 1.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

	Unit Filter Run Volume	This is an indicator of filter performance. If the value is > 200 m^3/m^2, then the filters are typically performing well. An average Unit Filter Run Volume can be calculated by dividing the Average Day Demand in m^3/day by the average number of filter washes per day (also called filter backwash frequency) and dividing that result by the average filter surface area in m^2 of one filter. It can also be calculated for individual filters by dividing the volume of water in m^3 produced by an individual filter, between backwashes, by the unit filter surface area in m^2 (if calculated for individual filters, the average should be entered into this field).
	Are Filters Backwashed Based on Effluent Quality?	Yes/No answer required. Is the filter backwash frequency based on effluent quality?
	Are Filters Backwashed Based on Run Length?	Yes/No answer required. Is the filter backwash frequency based on run length?
	Filter inlet turbidity	Record the average filter inlet turbidity in NTU.
	Filter media type	Material inside of the filter. Filters can contain one type of material or layers of graduated sizes of different material. List filter material in order of quantity, for example: sand filter, anthracite cap.
	Filter media age	Average age of filter media. If more than one type of filter exists, list average age for each type. For example, if multimedia and GAC filters exist, enter average age for multimedia, and average age of GAC media.
T-SUFFICIENT QUANTITY		
Goal 2: Capacity	Total raw water storage capacity	Total raw water storage capacity between the source and the treatment plant (ML).
	# of days that plant operated at > 90% capacity	Number of days that the treatment plant operated at greater than 90% of its maximum rated treatment capacity (only required for filtered systems as data is not graphed for unfiltered systems).
	# of days that plant operated at > 100% capacity	Number of days that the treatment plant operated at greater than 100% of its maximum rated treatment *capacity* (only required for filtered systems as data is not graphed for unfiltered systems).
T-SUSTAINABLE COST		
Goal 3 - Contracting	Are significant portions of your operations externally provided by a contracted service?	Yes/no answer is required with further explanation to be placed in the notes field. If *significant portions* of the plant operations are undertaken by an external company or contracted service, then answer Yes. *(ex. OCWA, EPCOR)*
	Estimate for % of O&M work provided by a contracted service	An estimate for the percentage of O&M work that is externally contracted (ie excluding capital) rather than completed inhouse. The following calculation can be used for this estimate: Contracted Services (External) - Labour / (Wages + Contracted Services (Internal) - Labour + Contracted Services (External) - Labour) or if the split between labour and other contracted services is unknown, the calculation should be Contracted Services (External) - Other / (Wages + Equipment and Materials + Contracted Services (Internal) - Other + Contracted Services (External) - Other). If all O&M work is completed inhouse then enter 0%. If all operations are externally provided by a contracted service then the % will be close to 100%. Most treatment systems will have a percentage between 0% and 100%. Details of the activities that are contracted out should be provided in the Notes field (eg residuals disposal, electrical work, emergency repairs, etc).
Goal 3 - O&M Costs	Total Costs - O&M	Sum of the actual O&M costs incurred in the operation of the water treatment plant (excludes capital costs, indirect costs, transfers to reserves and debt/interest charges). Revenues are only included where there are recoveries for work done by Water Utility staff that is extraneous to the utility (for example, for lab tests for other utilities). *Total O&M should exclude O&M revenues received for treated water supplied to neighbouring regions/municipalities.*
	Total cost	Sum of the actual O&M costs and corporate service (indirect) cost allocations annually (excludes capital costs). Contractor costs will be classified as internal or external. Includes labour, material & supplies, contracted/lump sum costs, lab, administration, facilities management (janitorial services, painting etc), customer services and fleet. Excludes transfers to reserves and debt/interest charges. Revenues are only included where they are recoveries for work done by water utility staff that is extraneous to the utility (for example, for lab tests for other utilities).

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

	Wages	Cost of wages for internal operations, maintenance and support staff. Includes regular salaries, overtime, holidays paid sick time, casual wages, fringe benefits and meal allowances. Also includes revenues/recoveries that balance work performed by water utility staff that is extraneous to the water utility (for example, when lab staff perform tests for other municipalities). Excludes internal costs for capital construction related projects (e.g. hydraulic modeling). Also excludes internal costs for GIS staff as these are considered under indirect costs as they are IT related. For technical and engineering internal costs include only the costs that is directly related to operations and maintenance (e.g. for chemical engineers undertaking ongoing process optimization for the plant).
	Equipment and Materials (Supplies)	Cost of equipment and materials required for operations, maintenance or support activities and staff. Includes for example courier costs, postage, equipment rentals, repairs (parts), laundry, safety supplies, telephone, uniforms, vehicle and equipment insurance, and building utility fees for solid waste, garbage and sewer.
	Contracted Services - Internal	Cost of work completed by an internal municipal department that relates to operations, maintenance or support and is charged back to the water treatment plant as a contracted cost. Includes for example charge back for radio equipment and building services such as garbage collection and recycling. Excludes internal costs for capital construction related projects (e.g. hydraulic modeling). Also excludes internal costs for GIS staff as these are considered under indirect costs as they are IT related. For technical and engineering internal costs include only the costs that is directly related to operations and maintenance (e.g. for chemical engineers undertaking ongoing process optimization for the plant).
	Contracted Services - External	Cost of work completed by an external contractor or business that relates to operations, maintenance or support and is charged to the water treatment plant as a contracted cost. Includes for example advertising, building repairs, ground maintenance, hauling services, contracted janitorial services, consulting engineering fees related to non-capital work and fleet. Excludes external contracted costs for capital construction related work.
	Energy	Cost of all energy used in the operation and maintenance of water treatment plant. Includes high lift pumps for treated water that are a part of the plant. Does NOT include the energy used at the works yard, offices or vehicle use. All energy purchase costs should include the direct cost of energy, its delivery, distribution, taxes, surcharges and similar costs.
	Staff Training	Includes association dues, membership fees, publications, conventions, training courses, conferences, travel associated with courses for operations, maintenance and support staff.
	Confidence Rating	Rate how confident you are with the values provided. Allocate a rating of 3 down to 1 according to whether your supporting data set is: 3. robust and fully auditable 2. partially anecdotal, often requiring some degree of interpretation 1. anecdotal
	Other	Includes other O&M costs associated with the water treatment plant such as rent, property taxes, permit fees, utility charges for water etc.
Goal 3 - Actual Indirect Costs	Charge Backs	The total cost of all indirect services that the utility paid under the water treatment plant's budget. Indirect services include Admin, Human Resources, Finance, Customer billing, Insurance, IT (including GIS and other information management systems except for Maintenance Management Systems as these are considered O&M) and any other similar supporting costs.
Goal 3 - Capital Costs	Capital cost	The costs for capital projects including reinvestment in the existing system and new investment for upgrades and expansions to handle growth. Include both contracted capital work and internal costs associated with capital such as wages for capital engineering staff i.e. design, tendering, studies, etc. Capital projects cover equipment and large maintenance expenditures that cannot be funded through the operating budget.
	New capital investment (previously called capital new work)	A project to expand the system to handle growth and upgrade to a higher level of service. Projects which serve one or more purpose (maintenance and expansion) should be prorated in order to also capture the capital applied for reinvestment activities. Include both contracted capital work and internal costs associated with capital such as wages for capital engineering staff i.e. design, tendering, etc. Includes new capital costs for utility systems components (for example: pipes (including valves, hydrants, reservoirs etc), pump stations and meters).

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

	Capital reinvestment (previously called capital existing work and capital maintenance)	A project which substantially maintains the life of the treatment system. This is intended to be a measure of reinvestment to maintain current facilities and excludes expansion of system to handle growth and upgrading to a higher level of service. Projects which serve one or more purpose (maintenance and expansion) should be prorated in order to also capture the capital applied for investment activities. Include both contracted capital work and internal costs associated with capital such as wages for capital engineering staff i.e. design, tendering, etc. Includes capital reinvestment (i.e. replacement) costs for utility systems components (for example: pipes (including valves, hydrants, reservoirs etc), pump stations and meters).
	Net Change in Capital Reserves	This is the difference between Capital Reserves at December 31st less Capital Reserves at January 1st of the year being benchmarked. Exclude rate stabilization reserves or operating reserves. If the capital reserve is for the full water utility them the net change value should be prorated between the water system and each treatment plant (for example, by replacement value).
	Current Capital Reserves	The total value for the capital reserve at the year end. Includes all reserve funds for future rehabilitation and expansions of the system. Doesn't include rate stabilization reserves or operating reserves. If the capital reserve is for the full water utility, the value should be prorated between the water system and each treatment plant (for e.g. by replacement value).
	Notes, Capital Cost	What is your limit for minor capital that is included under the O&M budget? Do you have separate capital reserves for pipes and treatment? Do you have separate capital reserves for new capital and reinvestment?
Goal 3 - Other Costs	Cost of plant water quality monitoring	Annual costs of all water quality monitoring for the treatment plant. Includes laboratory wages, supplies, contracted work etc.
	Current year O&M budget allocation	Approved operations and maintenance budget for the upcoming year (the year of data capture, typically 1 year after the year data is collected for). Collect separately for each water treatment plant.
	Current Year Capital Reinvestment Budget Allocation	Approved capital reinvestment budget for the upcoming year (the year of data capture, typically 1 year after the year data is collected for). Collect separately for each water treatment plant/system.
Goal 3 - FTEs	FTE	Full-time equivalent 1 FTE = 2080 hours = 52 x 40 hr week. Therefore, this number is not a measure of effort. It accounts for hours whether worked, taken as vacation or recorded as sick or other leave. Includes both permanent and temporary staff and "contracted" includes equivalent FTEs for all staff employed by an outside company.
	Employee FTEs	FTE - Full Time Equivalent for employees' definition. Water Treatment Plant FTEs are the full time equivalents of the employees working on the water treatment plant.
	Contracted FTEs	See "FTE" - Full Time Equivalent for employees' definition. Contracted FTEs are employees working on the water treatment plant that work for an organization external to the City/ Region.
	Field staff	See also "FTE" definition. Employees who work in the plant and are involved in the day to day operations and maintenance. Does not include supervisors, support, or technical/engineering staff. Also referred to as "outside staff".
	Technical/engineering staff	See also "FTE" definition. Engineers, chemists, technician working in plant operations. Does not include design and construction staff associated with capital projects.
	Supervisor/support	See also "FTE" definition. Full time equivalent employees in supervision and administration (and dedicated indirect staff such as finance, fleet, customer services etc) which support the water treatment plant and are based at the treatment plant.
	Laboratory staff	See also "FTE" definition. Includes the number of FTEs who work in the laboratory providing service to water treatment plant.
	Watershed protection field	The full-time equivalent employees for the treatment plant (or source) field staff that work specifically on watershed protection (a subset of treatment plant (or source) field FTEs).
Goal 3 - Energy	Energy consumption	Data on energy consumed in the treatment plant for each energy source (including pumping within the plant of both raw and treated water). Energy sources include electricity, natural gas, oil, propane and diesel.
	Electricity consumed	Amount of electricity consumed annually while operating and maintaining the plant, includes energy for high lift pumping of treated water.
	Natural gas consumed	Amount of natural gas in GJ consumed annually while operating and maintaining the plant. If data is provided in m^3, then multiply by 0.0373 to convert to GJ.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

	Oil consumed	Amount of oil consumed annually while operating and maintaining the plant.
	Propane consumed	Amount of propane consumed annually while operating and maintaining the plant.
	Diesel consumed	Amount of diesel consumed annually while operating and maintaining the plant.
	Total Energy Consumed	Sum of the energy consumed in kWh in the operation and maintenance of the water treatment plant, and high lift pumps within the plant. Energy sources include electricity, natural gas, oil, propane and diesel and are converted to kWh
	Cost of energy purchased	Cost of energy consumed in the treatment plant for each energy source (including pumping within the plant of both raw and treated water). Energy sources include electricity, natural gas, oil, propane and diesel. For the subset of electricity for treated water pumping, also provide the cost of this electricity consumption separately in the field below. All energy purchase costs should include the direct cost of energy, its delivery, distribution, taxes, surcharges and similar costs.
	Electricity for High Lift Pumping	Subset of Electricity: record the annual actual or approximate amount of electricity used for pumping treated water by high lift pumps.
Goal 3 - Chemicals	Chemical Consumption	All costs for chemicals including the cost of delivery used at the water treatment plant. The value should only include the chemicals consumed this year and not the total amount of chemicals purchased.
	Chemical	Name of the Chemical used in the treatment plant. Select the Chemical by scrolling through the drop down box.
	Amount Consumed	Annual consumption of this chemical in the treatment plant. The value should only include the chemicals consumed this year and not the total amount of chemicals purchased.
	Used for	Describe what the chemical is used for. For example: Chlorine is used for disinfection, Alum is used for coagulation.
	% Concentration	% concentration or the strength of the solution. This is the batch strength of dry chemicals mixed with water in a tank or amount of dilution. If chemical is supplied as a liquid solution and fed as shipped from the supplier, the information should be available from the chemical supplier. The concentration is required to determine the chemical dosage.
	Annual Cost	Annual cost for each chemical listed in the table. The value reported should only include the cost for the chemicals consumed this year and not the total cost of chemicals purchased.
	Unit Cost	Unit cost of each chemical used in the table. Enter only the $ value in this column, enter the unit value in the column to the right.
	Unit	See Unit Cost (Chemicals). This column is only for the unit value.
	Total Chemical Costs	All costs for chemicals consumed including the cost of delivery.
	Average Coagulant Dosage	Average litres of liquid coagulant per day divided by the average litres of treated water per day, multiplied by 1,000,000. For example: 55 L of coagulant is used per day. Average treated water of 700,000 L. Average dosage of coagulant is 79 mg/L. If dry coagulant is used, multiply the result by the % solution. For example: 300 L of a 10% solution of dry alum & water dosed into an average treated water of 700,000 L. This results in 429 mg/L of solution fed, but the amount of chemical dosed is 42.9 mg/L.
	Average Flocculant Dosage	Average litres of chemical used per day divided by the average litres of treated water per day, multiplied by 1,000,000. For example: 1 litre of flocculant used per day. Average treated water of 700,000 L. The average dosage of flocculant is 1.43 mg/L.
	Average Filter Aid Dosage	Average Litres of chemical used per day for each filter divided by the average litres of water treated by that filter per day, multiplied by 1,000,000. For example: 0.1 litres of filter aid used per day. Average treated water of 100,000L. The average dosage of filter aid is 1 mg/L.
	Is chemical dosing control fully automated?	Yes/no answer is required for the type of dosing control used for treatment chemicals with further explanation to be provided in the notes field. Fully automated dosing control is flow paced with feedback control.
	Is chemical dosing control semi-automated?	Yes/no answer is required for the type of dosing control used for treatment chemicals with further explanation to be provided in the notes field. Semi-automated dosing control is flow paced only.
	Is chemical dosing control manual?	Yes/no answer is required for the type of dosing control used for treatment chemicals with further explanation to be provided in the notes field. Manual dosing control is fully manual with no automation.
	Is coagulant dosing control fully automated?	Yes/no answer is required for the type of dosing control used for coagulants with further explanation to be provided in the notes field. Fully automated dosing control is flow paced with feedback control.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

Goal 3 - Maintenance Planning	Is coagulant dosing control semi-automated?	Yes/no answer is required for the type of dosing control used for coagulants with further explanation to be provided in the notes field. Semi-automated dosing control is flow paced only.
	Is coagulant dosing control manual?	Yes/no answer is required for the type of dosing control used for coagulants with further explanation to be provided in the notes field. Manual dosing control is fully manual with no automation.
	Notes on chemical dosing control	Provide further detail on the dosing controls used for the different chemical types.
	Total maintenance hours	Sum of all maintenance hours below. = Emergency Maintenance + Urgent Maintenance + Corrective Maintenance + Preventative Maintenance + Inspections + Capital + Other hours.
	Emergency maintenance hours (unplanned & unscheduled)	Emergency hours = # of hours spent by maintenance staff on emergency work (repairing equipment after it has broken down). Emergency work requires rapid response in order to protect life, property, or the environment. Emergency maintenance must be deployed as soon as possible and may require the use of overtime. Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external). Use total hours and non-paid hours (in the case of overtime). Emergency maintenance hours completed by operations staff should also be included in this section.
	Urgent maintenance hours (unplanned & unscheduled)	Urgent maintenance hours = # of hours spent by maintenance staff on maintenance work that causes you to interrupt your daily schedule but is not captured under emergency work (above). Urgent work may not result in loss of service as the system is protected by equipment redundancy, and maintenance is deployed at the earliest practical convenience. As a guide include work that would cause you to interrupt your daily maintenance plan. Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external). Urgent maintenance hours completed by operations staff should also be included in this section.
	Corrective maintenance hours (planned & scheduled)	Corrective maintenance hours = # of hours spent by maintenance staff on routine corrective maintenance tasks. This is work that does not impact the normal schedule of work; that can be scheduled in advance, but is corrective in nature. Includes maintenance on redundant equipment that breaks down, but can be planned rather than undertaken immediately as an emergency or urgent response. Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external). Corrective maintenance hours completed by operations staff should also be included in this section.
	Preventative maintenance hours (planned & scheduled)	Preventative maintenance hours = # of hours spent on regularly scheduled and periodic maintenance as directed by vendor or other maintenance guide (time spent preventing possible break down, and extending the lifecycle of assets as specified by the vendor). Include both internal and external maintenance hours (e.g. some systems outsource all breakdown work therefore they should estimate all maintenance hours, both internal and external). Preventative maintenance hours completed by operations staff should also be included in this section.
	Inspection hours (planned & scheduled)	Inspection = # of hours spent inspecting the condition of equipment according to a planned schedule. This should include inspection time spent by both maintenance staff and operations staff. Note: Some utilities include inspections in their Preventative Maintenance program. If this is your situation, insert “0”, but check the box that indicates that your PM hours include Inspections) Inspection hours completed by operations staff should also be included in this section. An estimate is acceptable in cases where your Operations staff do not conduct inspection against a Work Order. Inspection hours completed by operations staff should also be included in this section.
	Capital project hours (planned & scheduled)	Capital projects hours = # of hours spent by maintenance staff on the construction or implementation of equipment or facilities that are new. This is differentiated from true maintenance work. (Maintenance staff working on capital work may result in growing maintenance backlogs). Capital project hours completed by operations staff should also be included in this section.
	Other maintenance hours	Other hours = # of hours spent by maintenance or operations staff on other work that is not captured by any of the above categories.
T-PUBLIC HEALTH AND SAFETY		

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

Water Regulations and Guidelines	Guideline for Canadian Drinking Water Quality	Yes/no answer is required with further explanation to be placed in the notes field.
	Provincial Guidelines/ Regulations	Yes/no answer is required with further explanation to be placed in the notes field. For example Ontario drinking water act, regulation 459/00, and Fisheries Act.
	EPA Guidelines/ Regulations	Yes/no answer is required with further explanation to be placed in the notes field.
	Other Guidelines/ Regulations	Yes/no answer is required with further explanation to be placed in the notes field.
	Have water quality regulations changed during year?	Yes/no answer is required with further explanation of how the regulations have changed to be provided in the notes field.
Water Quality Tests	Is raw water turbidity monitoring frequency at least every 4 hours?	Yes/No field with further explanation to be provided in the notes field. Answer "Yes" if raw water turbidity monitoring frequency is at least every 4 hours or more frequently.
	Is raw water turbidity monitoring frequency b/w 4 hours & daily?	Yes/No field with further explanation to be provided in the notes field. Answer "Yes" if raw water turbidity monitoring frequency is between 4 hours and daily.
	Is raw water turbidity monitoring less frequent than daily?	Yes/No field with further explanation to be provided in the notes field. Answer "Yes" if raw water turbidity monitoring frequency is less frequently than daily.
	Is individual filter turbidity continuously monitored?	Yes/No field with further explanation to be provided in the notes field. Answer "Yes" if turbidity for individual filters is monitored continuously.
	Is combined filter turbidity continuously monitored?	Yes/No field with further explanation to be provided in the notes field. Answer "Yes" if turbidity for the combined filters is monitored continuously.
High Quality Water	Turbidity (filtration)	If the datasheets are being completed for a filtration plant (e.g. Direct filtration, membrane, or conventional filtration) then the values for the plant turbidity target, the average turbidity value and the number of days with an occurrence over the group target should be entered into this row of the datasheets (see definitions for these terms below).
	Turbidity (unfiltered plants)	If the datasheets are being completed for an unfiltered system (e.g. disinfection only, iron and manganese treatment or no treatment) then the values for the plant target, the average turbidity value and the number of days with an occurrence over the group target should be entered into this row of the datasheets (see definitions for these terms below).
	Total coli	Enter the number of days with positive occurrences of Total coliform in samples tested (if the sample has to retest positive before being considered as a positive sample then only include these). The concentration of coliform organisms, the total coliform group includes four genera in the Enterobacteriaceae family, including; Escherichia, Klevisella, Citrobactor and Enterobacter.
	Faecal coli	Enter the number of days with positive occurrences of Faecal coliform in samples tested (if the sample has to retest positive before being considered as a positive sample then only include these). Faecal coliforms are bacteria associated with human or animal wastes.
	E.coli	Enter the number of days with positive occurrences of E. coli in samples tested (if the sample has to retest positive before being considered as a positive sample then only include these). E. Coli, is a fecal coliform bacteria that is an indication of sewage or animal waste contamination.
	Giardia	Enter values for the plant target, the average value and the number of days with an occurrence over the group target (see definitions for these terms below). A protozoan parasite, a unicellular and colourless organism that lack cell walls, which can be found in contaminated surface water. The two species of Giardia and their potential hosts are G. intestinalis (humans) and G. muris (mice).
	Cryptosporidium	Enter values for the plant target, the average value and the number of days with an occurrence over the group target (see definitions for these terms below). A protozoan parasite causing gastrointestinal illness found in water and other media.
	Nitrate-nitrogen	Enter values for the plant target, the average value and the number of days with an occurrence over the group target (see definitions for these terms below). Nitrates (NO3) are inorganic ions found in surface water sources and groundwater. Any source of Nitrogen can be potentially converted to nitrate. Contamination commonly comes from septic system, agricultural fertilizers, erosion of natural deposits and feed lots.

WATER TREATMENT

Water Treatment Plant Definitions by Hyperlinks

	Arsenic	Enter values for the plant target, the average value and the number of days with an occurrence over the group target (see definitions for these terms below). Arsenic is a toxic metalloid element easily dissolved in water and designated as highly carcinogenic.
	Group target for high quality water parameters	A theoretical target for treated water for each of the selected water quality parameters that will be used by the benchmarking participants as an indicator of whether high quality water is being produced from the treatment plants. The targets are based on a comparison of both the Canadian Drinking Water Guidelines and the USEPA regulations and are typically expressed as limits (e.g. the group target for Faecal coliforms is 0 positive occurrences).
	Plant target for high quality water parameters	The actual target value for treated water used by the individual utility for each of the selected water quality parameters for the treatment plants.
	Average Value for high quality water parameters	The average value for each of the selected water quality parameters based on all treated water quality samples.
	# of days over group target for high quality water parameters	The number of days with an occurrence during the year where treated water quality samples showed values higher than the group target (for each of the selected water quality parameters) for the treatment plants.
Water Testing	Do you test for this parameter?	Yes/no answer is required for each parameter, Giardia, Cryptosporidium, Nitrates and Arsenic, with further explanation to be provided in the notes field.
	Is the testing voluntary?	Yes/no answer is required for each parameter, Giardia, Cryptosporidium, Nitrates and Arsenic, with further explanation to be provided in the notes field.
	Is the testing mandatory?	Yes/no answer is required for each parameter, Giardia, Cryptosporidium, Nitrates and Arsenic, with further explanation to be provided in the notes field.
Security	Do you undertaken a security audit of your system?	Yes/no answer is required with further explanation to be placed in the notes field.
	Is the plant accessible to the public?	Yes/no answer is required with further explanation to be placed in the notes field.
	Is plant entry controlled automatically?	Yes/no answer is required with further explanation to be placed in the notes field.
	Is plant entry controlled by an attendant?	Yes/no answer is required with further explanation to be placed in the notes field.
	Do you have emergency procedures for security breaches?	Yes/no answer is required with further explanation to be placed in the notes field.
T-SAFE AND PRODUCTIVE		
Labour Issues	# of accidents with lost time	Number of accidents, which caused the worker to incur time off work. Exclude accidents incurred during capital construction.
	# of lost hours due to accidents	Total number of hours that field staff were not at work due to accidents. Exclude accidents incurred during capital construction.
	# of sick days allowed per field employee	This is the number of sick days allowed for field employees as stated in the collective bargaining agreement for the union. This number only includes the number of days before pay is reduced or long term disability is in effect. This number may be different for each labour category, however the average should be calculated.
	# of sick days taken per field employee	Average number of sick days taken per field employee, including days taken because of sick kids or sick spouses. Excludes long term disability and any time paid by WCB. Also record total # of sick hours taken for field employees for use in the availability calculations.
	# of safety training hours per field employee	Average number of safety training hours per field employee. Equal to the total number of safety training hours divided by the number of FTE field employees.
Availability	Total # of safety training hours for actual employees	The total number of safety training hours taken for all field staff employees that includes confined space entry, safety meetings, hazardous chemical training, WHMIS etc. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of other training hours per employee	The total number of other training hours taken for all field staff employees that excludes safety training hours but includes conferences, seminars etc. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of sick hours taken for actual employees	The total number of sick hours taken by field staff employees. Equals the number of average # of sick days taken per employee * # of employees * 8 hours per day. Actual employees refers to the number of field FTEs as entered in the section previous.

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	Total # of long term leave hours taken for actual employees	The total number of long term leave hours for all field staff employees which is additional to sick days taken. Includes long term leave when staff are not replaced and hours paid by the Workplace Safety and Insurance Board or the Workers Compensation Board. If the employee was on WCB for the full year, then their long term leave hours should not be included. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of vacation hours for actual employees	The total number of vacation hours taken by field staff employees that includes annual leave, maternity or paternity leave, leave without pay and statutory holidays. If the employee was on maternity or paternity leave for the full year, then their hours should not be included. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total # of other paid hours for actual employees	*Include all other paid hours where field staff were unavailable for work (e.g. family issues, bereavements).*
	Total # of union paid hours for actual employees	Total # of union paid hours for actual employees. The total number of hours that field staff employees were unavailable for work due to union duties (and their time was paid for by the union) for example to attend union meetings. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total paid hours for actual employees	Total number of standard paid hours recorded for all field staff excluding overtime hours. If total is unknown, it can be calculated by "# of actual field staff x average # of paid hours per field staff per year" where average # of paid hours per field staff per year is typically 2080 hours. Exclude hours for field staff that are on WCB, maternity leave or paternity leave for the full year. Actual employees refers to the number of field FTEs as entered in the section previous.
	Total available hours for actual employees	= Total paid hours – Total unavailable hours. Where total unavailable hours = vacation hours + optional training hours + safety training hours + sick hours + long term leave hours + union paid hours.
	Total overtime hours	Total number of overtime hours recorded for all field staff; do not include overtime hours that are paid in lieu, or that are accrued from working a normal shift on a statutory holiday. If actual hours are not available, calculate as "# of actual field staff x average number of recorded overtime hours per field staff per year less any hours previously described".
	Cost of overtime hours	This is the total cost of overtime hours recorded in the above box. Use actual cost of overtime hours where possible, or an approximate cost such as: total overtime hours x average cost per overtime hour.
Retirement	# of field employees in age bracket ##-##	Number of field staff employees that are within the given age bracket in the current year when the data sheets are being completed.
	What is the typical retirement age for field staff?	The objective of the question is to identify a potential staffing crunch due to retirement of field staff in the upcoming 5 to 10 years.
	# of field staff eligible to retire in X to X years	The calculations for these measures are based on assuming that staff are eligible to retire after either Y years of service or Z years old, whichever condition comes first. To report the number of staff that are eligible to retire in X years, you need to calculate for each field staff their age (z), years of service (y) and number of years until eligible for retirement (x). Where number of years until eligible for retirement can be calculated as follows: if Z > z then x = (Y - y) unless (z + (Y-y)) > Z then x = Z - z If z > Z then x = 0 For example, if Y = 30 and Z = 65 and Joe is 57 and has 10 years of service then he is eligible to retire after 8 years (65-57) because (57 + (30-10)) > 65. See also the Retirement template in the online Data Collection Resource Kit for calculations. This data should be provided based on the current year when the data sheets are being completed.
Customer Communication	Do you have a customer call centre?	Yes/no answer is required with further explanation to be placed in the notes field. Customer call centre that takes water quality complaints or requests and notifies the maintenance or planning department.
	Do you have a customer communications department?	Yes/no answer is required with further explanation to be placed in the notes field. Customer communications department that deals with communicating at all levels with the public.
	Do you have a customer communication plan?	Yes/no answer is required with further explanation to be placed in the notes field. Customer communication plan is an organized process used to deal with customer complaints and requests. A communication plan is a set of established protocols which are used when disseminating information about the utility to the public..

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	Do you have performance standards for response times?	Yes/no answer is required with further explanation to be placed in the notes field. Performance standards are written protocols and standards for the water treatment plant activities.
	What is the standard response time?	In hours, what is the standard response time?
	Is water quality data readily available to the public?	Yes/no answer is required with further explanation to be placed in the notes field. Is water quality data available on the internet or at the office for the public.
	Do you advise customers about levels of satisfaction?	Yes/no answer is required with further explanation to be placed in the notes field. By the internet, newsletter or paper, etc. do you advise customers about the levels of satisfaction of the water treatment plant?
T-PROTECT THE ENVIRONMENT		
Removal of Clarifier Residual (CR)	Volume of CR removed from clarifier	Volume of CR removed from the main clarification process annually in ML
	CR removal cost	Annual cost for the removal of residuals from the clarifier. Includes cost of energy, labour, equipment and any other costs related to the removal of residuals from the clarifier.
Disposal of Untreated Clarifier Residual	Volume of untreated CR disposed	Volume of untreated CR disposed of annually in ML. If blended with other residuals and the CR volume is not known, leave blank and complete the Total Liquid Waste field and the end of this section.
	Untreated CR Disposal Route	Yes/No answer required for the untreated clarifier disposal route - water course, sewer, lagoon, off-site, or other. Describe disposal route in notes field.
	Untreated CR disposal cost	Annual costs for the disposal of untreated CR
Disposal of treated Clarifier Residual Supernatant	Volume of treated CR supernatant disposed	Volume of treated CR supernatant disposed of annually in ML. If blended with other residuals and the CR volume is not known, leave blank and complete the Total Liquid Waste field at the end of this section.
	CR supernatant treatment method	Yes/No answer required for the treatment method for clarifier residuals supernatant - clarifier, filter, membrane, other, not treated. Describe treatment method in notes field.
	CR supernatant treatment cost	Annual cost of CR supernatant treatment.
Disposal of Clarifier Residual Sludge	Mass of dry solids in CR sludge	Annual mass of dry solids in treated CR sludge disposed of.
	% solids in CR sludge	Average % dry solids in the sludge produced from CR treatment
	CR sludge treatment method	Yes/No answer required for the treatment method for clarifier residuals sludge - dewatered, thickened, drying beds, other, not treated. Describe treatment method in notes field.
	CR sludge disposal route	Yes/No answer required for the clarifier residual sludge disposal route - landfilled, land applied, or other. Describe disposal route in notes field.
	CR sludge treatment and disposal cost	Annual cost of treating and disposing CR sludge
Backwash Waste (BWW) Treatment	Volume of BWW produced	Volume of Filter Backwash Waste produced annually in ML
	Volume of BWW treated	Volume of Filter Backwash Waste that goes for further treatment prior to disposal. Annual figure in ML
	BWW treatment method	Yes/No answer required for the treatment method for backwash waste - clarifier, filter, membrane, other, not treated. Describe treatment method in notes field.
	BWW treatment cost	Annual cost of backwash waste treatment
Disposal of Untreated Backwash Waste	Volume of untreated BWW disposed	Annual volume of untreated BWW waste disposed of
	Untreated BWW disposal route	Yes/No answer required for the untreated backwash waste disposal route - water course, sewer, lagoon, off-site, or other. Describe disposal route in notes field.
	Untreated BWW disposal cost	Annual costs for the disposal of untreated BWW
Filter-to-Waste (FTW) Treatment	Volume of FTW produced	Volume of Filter to Waste produced annually in ML

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	Volume of FTW treated	Volume of Filter to Waste that goes for further treatment prior to disposal. Annual figure in ML
	FTW Treatment method	Yes/No answer required for the method of Filter-to-Waste treatment - clarifier, filter, membrane, other, not treated. Describe treatment method in notes field.
	FTW treatment cost	Annual cost of backwash waste treatment
Disposal of Untreated Filter-to-Waste	Volume of untreated FTW	Annual volume of untreated FTW waste disposed of
	Untreated FTW disposal route	Yes/No answer required for the untreated filter-to-waste disposal route - water course, sewer, lagoon, off-site, or other. Describe disposal route in notes field.
	Untreated FTW disposal cost	Annual costs for the disposal of untreated FTW
Total Liquid Waste Disposed of	Volume of total liquid waste disposed	Total volume of all liquid wastes disposed of annually in ML, this number should include all individual and combined waste streams, take care not to double count wastes.
	Total liquid waste management cost	Total annual cost of liquid waste management. Includes treatment and disposal.
Total Solid Waste Disposed of	Mass of dry solids in total solid waste	Total Annual mass in Dry tonnes, (calculated by multiplying the total wet mass by the % dry solids)
	% solids in total solid waste	average % dry solids of the total solid waste, this may need to be calculated from individual streams
	Total solid waste management cost	Total annual cost of solid waste management. Includes treatment and disposal.