

2.0 The Undertaking

2.1 Project Title

Water Treatment Plant, Town of Oromocto, Oromocto, NB

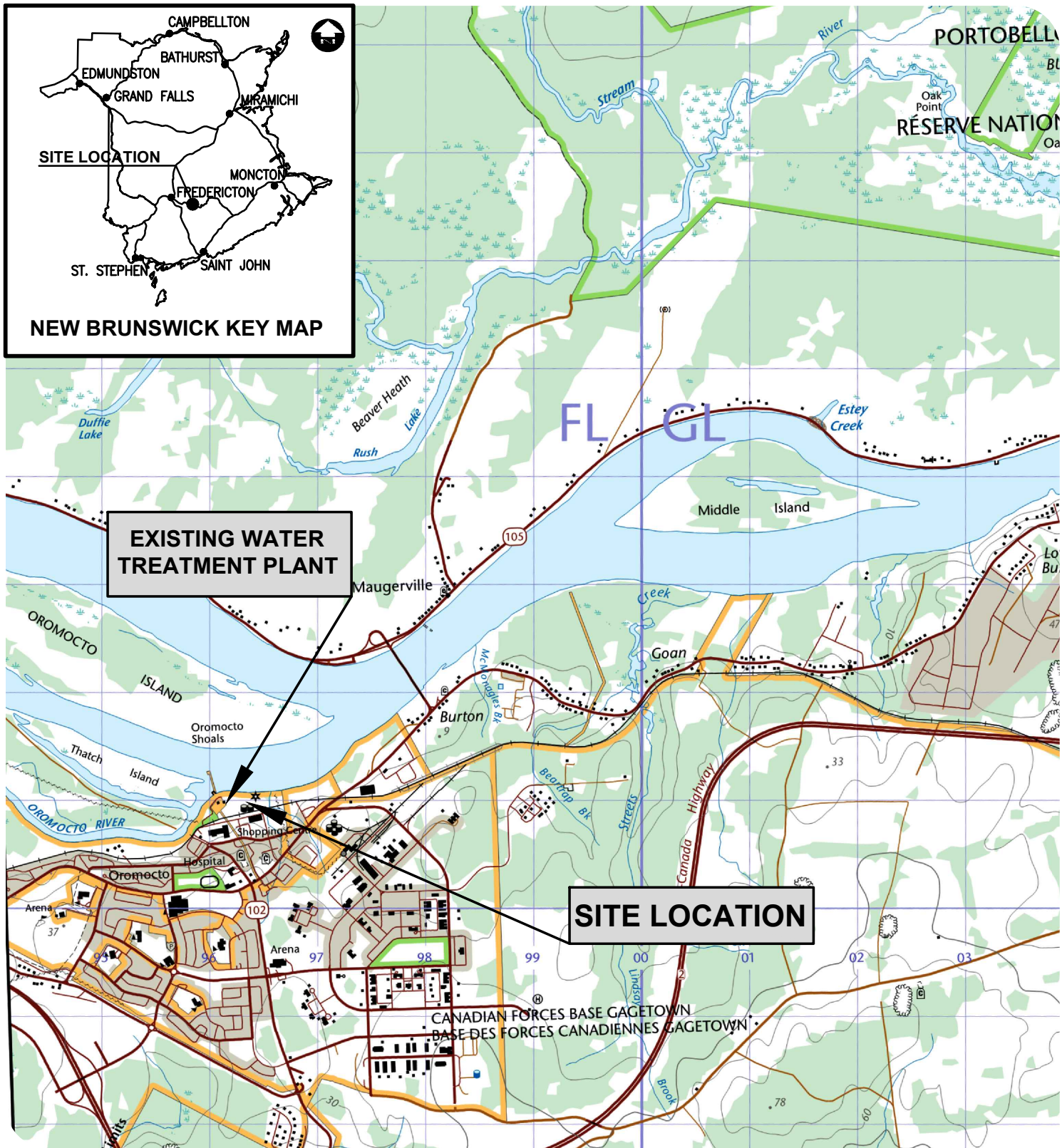
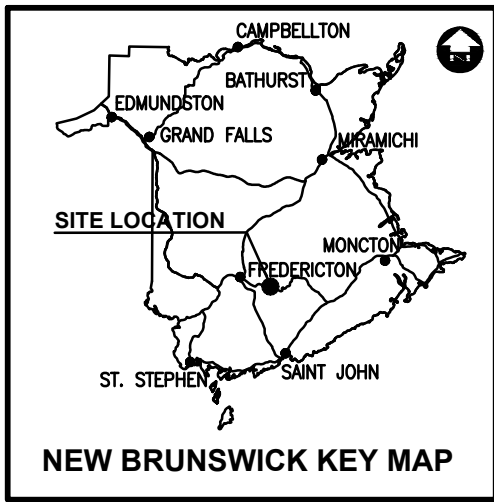
2.2 Project Overview

The Department of National Defence (DND) operates the existing 5CDSB Gagetown Water Treatment Plant (WTP) which serves 5CDSB Gagetown (the Base) and the Town of Oromocto (the Town). The DND is investigating the potential for a new water treatment plant (WTP) in Oromocto, NB, as presented on **Figure 2-1**. Currently, the proposed project location for the WTP is owned by the Town. The proposed new WTP will replace the existing WTP currently owned and operated by DND. The existing WTP is located approximately 200 m west of the proposed new WTP building. The intake line will also be replaced and will connect with the existing town water lines located west of the new WTP. Refer to **Figure 2-2**. The demolition of the existing WTP will not be included as part of this environmental impact assessment (EIA) registration and will be addressed under a separate project once the new WTP is operational.

There is a memorandum of understanding (MOU) where DND agrees to provide, and the town agrees to accept and pay, for water services used within the Town. In 2002, it was recognized by DND that the WTP consumes a great deal of personnel and financial support that would be better directed to the operational side of DND. Under the Vote 10 Capital Assistance Program (CAP), Land Forces Bases can implement projects to transfer control and responsibility of their water and wastewater treatment plants to municipal and/or provincial government agencies, which are better suited to provide these essential services. Under the CAP, DND has decided to investigate the potential for a new WTP which will service both the Base and the Town. The new WTP will be owned and operated by the Town. Under the CAP program, a Contribution Agreement will be prepared, once all documentation, including the provincial EIA are completed and approved. CAP funding will be transferred to the Town. The Town will be responsible for the design and construction of the new WTP

A Phase I Environmental Site Assessment (ESA) was conducted at the proposed WTP property by Dillon Consulting Limited (Dillon) in 2014 where it was determined that the location of the proposed WTP is a former petroleum bulk storage site. The results of the Phase I ESA indicate that there may be contamination from historic use of the site, although the extent and exact location are not known at this time. A Phase II ESA will be conducted to determine if potential contamination exists prior to the construction of the WTP, should questions regarding soil and substrate quality arise, remedial action will be undertaken in accordance with provincial

policies and regulations. This EIA registration has been prepared on the assumption that the site is acceptable for the proposed use.



WATER TREATMENT PLANT ENVIRONMENTAL IMPACT ASSESSMENT
ONONDAGA STREET,
OROMOCTO, NB

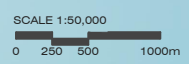
SITE LOCATION MAP
FIGURE 1



MAP/DRAWING INFORMATION
National Topographic System Mapsheet 21G/16.

CREATED BY: HEB
CHECKED BY: GAR
DESIGNED BY:


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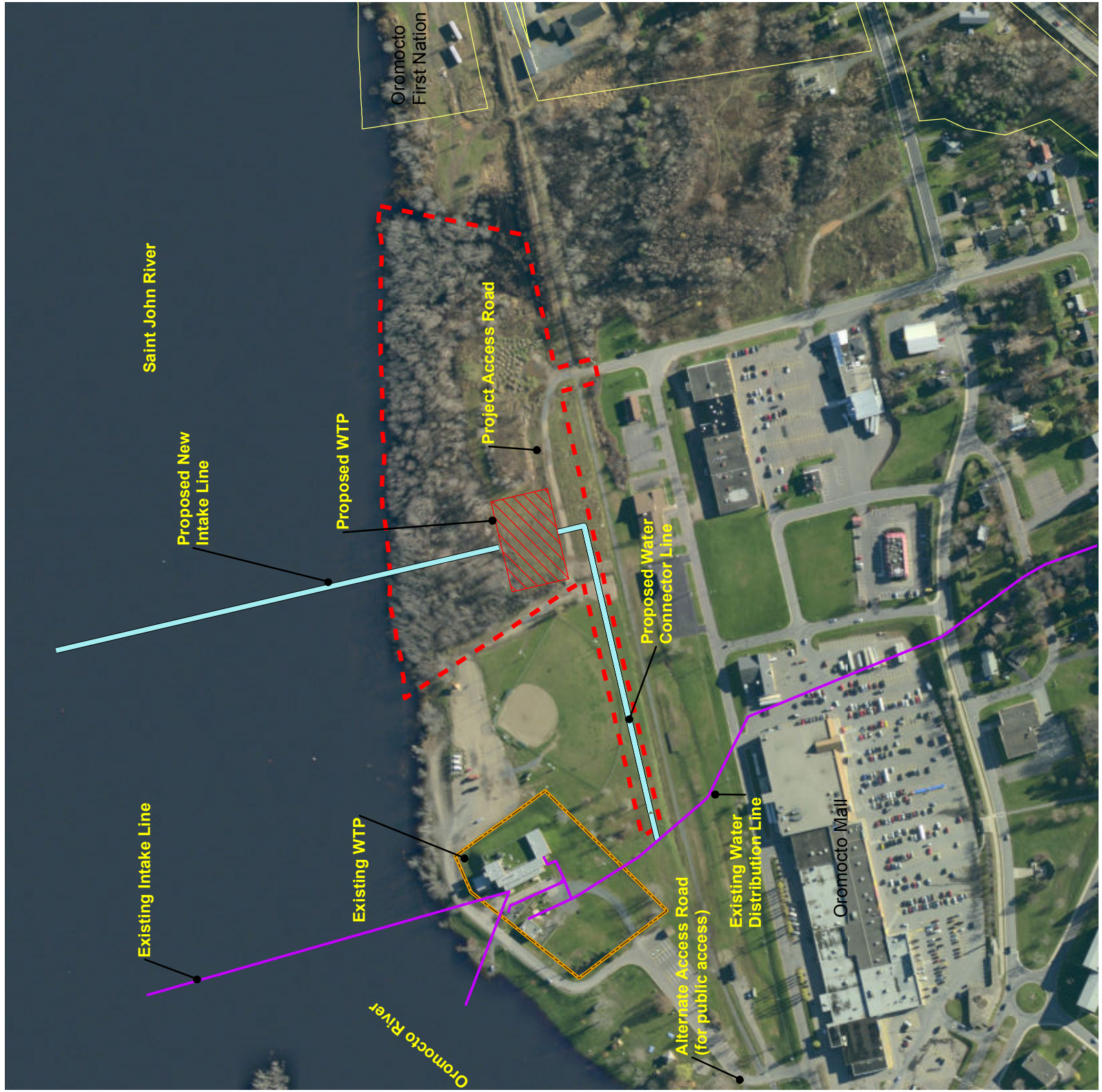
Site Location Aerial View
 Figure 2-2

-  PROPOSED FACILITY
-  PROPOSED BOUNDARY
-  PROVINCIALLY SIGNIFICANT WETLAND
-  DND PROPERTY BOUNDARY
-  PROPOSED INTAKE LINE
-  EXISTING WATER LINE

0 15 30 60 90 120 150 Meters



MAP CREDITS: ESRI, INRCAN, GEOBASE.
 MAP CREATED BY: SCM
 MAP CHECKED BY: RMD
 MAP PROJECTION: NAD 1983 UTM Zone 18N



2.3 Purpose/Rationale/Need for the Undertaking

The existing WTP was commissioned in the 1960s to support base operations, and provide potable water to the local community.

The WTP was “State of the Art” when it was commissioned; however, the current WTP and accompanying process technologies are nearing the end of their anticipated service life and are due for major upgrades or replacement (CBCL, 2012). Conventional treatment processes, like that employed in the existing WTP, have difficulty with removal of low density particles, particularly in cold water (CBCL, 2012). Conversely, modern treatment processes are better able to deal with challenges of treating soft, coloured water with a smaller footprint and a more cost effective system (CBCL, 2012). Refer to **Appendix A** for further details.

Since major upgrades or replacement is imminent and DND is preparing to transfer ownership and responsibility for the WTP to the Town, there is incentive for DND to investigate options for complete WTP replacement with support from Vote 10 CAP.

The alternatives to the project are to upgrade the existing WTP or do nothing. Upgrading the existing WTP, rather than completely replacing the aging WTP, could result in a failure to reach an agreement with the Town to take ownership and responsibility.

DND may also be unable to transfer ownership if the “do nothing” alternative is chosen. Failing to upgrade or replace the existing WTP could prevent adequate potable water treatment in the future event of process or equipment failures, which would pose a risk to local populations who rely on a safe and secure drinking water source.

2.4 Project Location

The proposed WTP location is on a property owned by the Town and identified by Service New Brunswick by parcel identification number (PID) 60006186. The property is approximately 4.47 hectares (ha) in area, located at approximate latitude N45° 51' 17.5" and longitude W66° 28' 12.6". The riverfront property, with no street address, is located along the Saint John River near the intersection of Onondaga Street and the NB Trail (former CN rail line) in Oromocto, Burton Parish, Sunbury County, New Brunswick, as illustrated on **Figure 2-1**. The proposed new water line, which would connect the new WTP to the existing water distribution line, crosses the adjacent Town-owned property to the west, identified by Service New Brunswick by PID 60113370.

The proposed site is located approximately 200 meters (m) to the east of the existing WTP properties, which are owned by DND and identified by Service New Brunswick PID 60113404, 60113388, and 60113396 (latitude N45° 51' 16.2" and longitude W66° 28' 27.7").

2.5 Siting Considerations

Adjacent land uses and the surrounding biophysical environment were considered when selecting the project site and a location was selected to minimize interaction with watercourses and wetlands, species at risk, protected drinking water wellfields and watersheds, environmentally significant areas (ESAs), First Nation lands, and DND facilities. Terrain constraints such as accessibility, slope and intensity of land use were also key factors in site selection. Land availability was another constraint. Environmental information was collected during background and biophysical investigations in 2014. Aerial photographs, digital GIS mapping resources, as well as field investigations were used to assist with the identification of potential constraints within the proposed project area.

The proposed WTP building location is near the access road, on the southern portion of a Town-owned property (PID 60006186), which is relatively flat and previously cleared. The northern portion of the property slopes gently north closer to the Saint John River. Surrounding property uses in the area are commercial and recreational. The surface locations have been chosen to minimize impacts on the local environment (e.g., ground disturbance) by utilizing existing local access and access roads. The preferred location for the new WTP is indicated on **Figure 2-1**.

In addition to the environmental constraints, several engineering constraints were considered when selecting the proposed project location. The new WTP needs to be in close proximity to the river for raw water intake. It also needs to be accessible by road and have an adequate power supply. Since the WTP building will be located near the Saint John River, the finish floor elevation needs to be high enough to “reduce the return period of a major flood event” (CBCL, 2012).

The proposed location is accessible by an unnamed, unpaved access road, which runs west from the end of Onondaga Street, along the south side of the property toward Hazen Park Centre. The proposed location is not currently serviced with electricity; however, power distribution lines run adjacent to the property so it is reasonable to conclude the requirement for an adequate power supply is met.

Dillon completed a Phase I ESA of the proposed property (PID 60006186) in 2014. The Phase I ESA revealed several potential sources of environmental concerns associated with the subject property. Most significantly, a petroleum bulk storage plant operated on the property from the 1960s until approximately 1999. Historical petroleum infrastructure associated with the former bulk plant presents a risk that contaminated soil and/or groundwater may be encountered in the vicinity of the former infrastructure during proposed WTP construction activities. If petroleum or metals contamination is encountered during construction, a Site Professional who is familiar with applicable contaminated sites regulations and requirements

would need to be engaged. It is anticipated that a further evaluation of the site will be undertaken and appropriate mitigation measures will be identified to render the site useful. This EIA registration has been prepared on the assumption that the site will be useable.

The Phase I ESA also identified metals-impacted soils in the vicinity of the former Oromocto Minor Shore Light (PID 60154507) as a potential source of concern; however, the proposed WTP project will not disturb the area of the former light station, which was located within 25 m of the shoreline, east of the proposed new intake line, from the 1890s until 2005.

The nearby ball field was initially considered as a potential location for a new WTP and satisfied the essential constraints; however, the ball field location is undesirable to the Town due to recent and significant financial expenditure on a new lighting system. The adjacent undeveloped riverfront property, also owned by the Town, was deemed a more favorable site for this reason.

2.6 Regulatory Framework

Under the provincial EIA Regulation – Clean Environment Act (NB Reg. 87-83) “...waterworks with a capacity greater than fifty cubic metres of water daily” requires registration and subsequent consideration by the Minister of Environment.

The WTP is subject to a variety of federal, provincial and municipal regulatory requirements including but not limited to those summarized in **Appendix B**.

2.7 Physical Components and Dimensions of the Project

The description of the project components and activities is based on a pre-design level of information. Refer to **Appendix A** for the preliminary study titled: “Engineering Study for the Wastewater Treatment Plant and Water Treatment Plant at CFB Gagetown (Draft)” conducted by CBCL in 2012. A preliminary site plan for the proposed WTP is provided in **Figure 2-2**. The new WTP building will be constructed on a property with an approximate area of 44,700 m², a maximum length of approximately 380 m and a maximum width of 180 m. The proposed development will include:

- the new approximately 1600 m² WTP building;
- any required access, parking, outbuildings, and fencing;
- a new raw water intake line;
- a new connection line from the proposed WTP to the water intake line; and ,
- a new sanitary pumpstation and forcemain to convey wastewater from the proposed WTP to the off-site municipal sewer.

The new WTP will make use of the existing access road, which runs parallel to the river along the south boundary of the subject property. External lighting may be required but detailed design of this aspect has not been completed. There will be an increase in traffic on the access road for materials delivery/pick-up and operations personnel and related municipal staff.

2.8 Construction Phase Details

The WTP will consist of several concurrent construction components including site preparation and civil works, facilities construction, intake line and water line construction. A description of the major components of the development is provided below.

2.8.1 Site Preparation and Civil Works

The first construction stages involve preparing the proposed project site for subsequent construction components. Site civil construction work includes clearing and grubbing, excavation and grading, paving and gravel access roads, and water lines (CBCL, 2012). The following sub-sections describe these activities in detail. Site civil also includes fencing, site finishes and reinstatement, and environmental protection and testing (CBCL, 2012).

Site preparation activities will be conducted to accommodate the WTP project footprint area and is expected to consist of:

- Minor vegetation clearing – the majority of the project footprint exists within a developed area and would require minimal tree clearing
- Excavation and grading
- Surface preparation (roads, parking areas)

The majority of the project will be accessed using existing access roads. These roads may require some minor improvements which will be identified following the final design.

2.8.1.1 Clearing and Grubbing

The proposed WTP site has been previously cleared. Low lying scrub vegetation currently covers the area identified for the footprint of the WTP and associated intake line and water line. This will be removed through grubbing. Clearing activities will adhere to applicable regulatory requirements and will only be done on an as required basis. Unnecessary tree removal will not occur.

Prior to grubbing activities sedimentation/siltation fencing will be set up around the perimeter of the project site. Grubbing will involve the removal of all organic material and unsuitable soil including all stumps, roots, felled timber, embedded logs, and root mat from the WTP area. Bulldozers will be used to scrape the organic material off the underlying soil. If the

grubbed material (spoils) cannot be used on site and requires removal, grubbings will be transported to a pre-approved disposal location. This material will not be piled into standing timber and will not be located within 30 m of a watercourse.

2.8.1.2 Excavation and Grading

Earthworks including grading and/or excavation will be required to prepare and level the site. Suitable soil material and overburden will be segregated so that it can be reused onsite. Additional material, if required, will be sourced locally. Soils will be covered and appropriate erosion and sediment control measures will be implemented if left on site for a period of time.

Once the site has been cleared and graded, the area will be stabilized with gravel to a required thickness capable of supporting heavy equipment traffic. The gravel will be brought in as required from an approved source (gravel pit).

2.8.1.3 Site Access

During construction, local access to the site will be off the existing access road. The project access roads will be re-graded and resurfaced with gravel, prior to, or concurrently with development of the site.

2.8.1.4 Paving and Gravel Access Roads

Some roads and parking areas on the property may be paved while others, such as the existing access road may be topped with pit run gravel or crushed rock, crowned, and compacted to minimize erosion and road dust emissions.

2.8.2 Facilities Construction

2.8.2.1 WTP Building Construction

The footprint of the WTP building will be approximately 1600 m² and the anticipated clear height of the building is 4.6 m (CBCL, 2012). Detailed building design has yet to be completed. It is reasonable to expect it will be a “standard” industrial building with architectural characteristics consisting of:

- reinforced concrete foundations;
- concrete slab on grade;
- pre-cast concrete roof panels;
- load-bearing concrete block with brick or split-faced block wall systems;
- internal concrete block partitions; and
- membrane roof system (CBCL, 2012).

The building will house a loading/unloading area, storage/work areas, offices and meeting space in addition to the fundamental needs for the WTP itself such as treatment equipment, a chlorine room, chemical storage, mechanical and electrical rooms, and a laboratory.

Building construction may generate recyclable materials that can be diverted from landfills and non-recyclable materials that must be disposed of in a construction and demolition or solid waste landfill.

2.8.2.2 Concrete and Waterproofing

Once the site is sufficiently prepared, several concrete structures will be constructed for WTP facilities including a clearwell, backwash equalization tank, chlorine contact time tank, intake well, and process tanks (CBCL, 2012).

2.8.3 Intake Line Construction

The new WTP site will require a new raw water intake line. The line will be installed through horizontal directional drill procedures. The intake location will be situated approximately 100 m from shore. The water intake line would be horizontally directionally drilled to a depth of approximately ten (10) meters. Refer to **Figure 2-2**. A new water line from the proposed WTP to the existing, off-site water distribution system will be installed as well as a new sanitary pumpstation and forcemain to convey wastewater from the proposed WTP building to the municipal sewer. DFO will be consulted on the design of the intake pipe in compliance with the *Fisheries Act* and the Freshwater Intake End-of-Pipe Fish Screen Guidelines (1995).

2.9 Operation and Maintenance Details

The main function of the WTP will be to treat incoming raw water and output potable water. Since the final process design has yet to be determined, the generalized (and simplified) process is illustrated in **Figure 2-3**. Three clarification and filtration processes are being considered including:

- Dissolved Air Filtration (DAF) with granular media filtration;
- Ballasted flocculation with granular media filtration; and,
- DAF with membrane filtration.

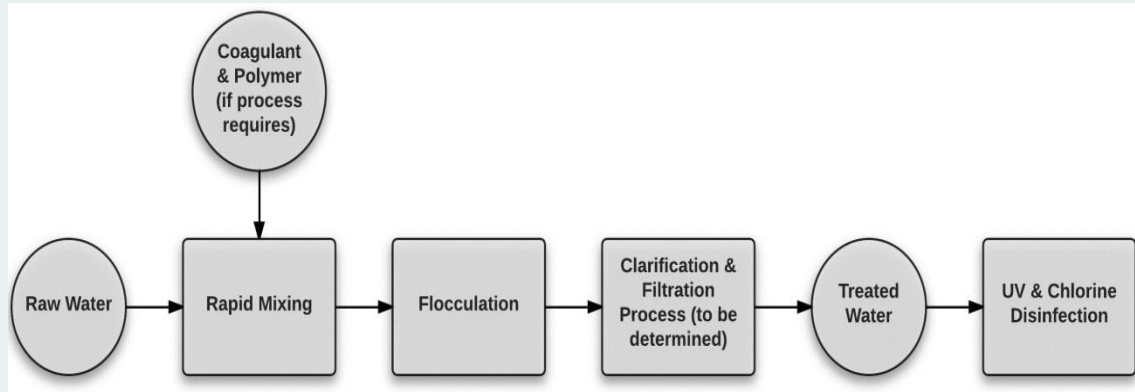


FIGURE 2-3: GENERALIZED WTP PROCESS

In each of the three processes being considered, the inputs are raw water, coagulant, and polymer (if ballasted flocculation option chosen). The output is treated water, which is then disinfected using both ultraviolet (UV) disinfection and chlorine disinfection.

The raw water intake line, low lift pump well, and new piping connections must be capable of supplying the average-day demand of 5209 m³/day (CBCL, 2012). The new WTP will be designed for an average day production capacity of 7500 m³/day and a maximum day capacity of 12,000 m³/day (CBCL, 2012). The estimated lifespan of the proposed WTP is estimated to be 25 years.

Routine maintenance and process monitoring will be required on a daily basis. Process specific maintenance will also be required depending on the final design. For example, filtration membranes would need to be replaced every 5 to 10 years (CBCL, 2012).

The WTP will be operated 24 hours per day, 7 days per week and staffed accordingly.

The quantity and type of coagulant, polymer, filtration media, and chlorine are not available at this time. The WTP building provides storage space for chlorine and chemicals in separate rooms. Raw materials, other than water, will be delivered to the WTP by truck.

Waste products of the WTP operations include sanitary waste, discharged to the Town sewer system, and solid waste (recyclables and garbage). Waste products of the process include waste sludge and Disinfection Byproducts (DBPs) such as trihalomethanes (THMs) and haloacetic acids (HAAs). Waste sludge will be transported offsite for disposal or composting (to be confirmed during design and approvals process). The operator (ultimately the Town, in this case) will typically monitor for DBPs in the distribution system. The process will be designed to produce DBPs that meet applicable guideline limits.

The new proposed WTP will obtain power from the existing NB Power transmission infrastructure nearby. The energy requirements are not known at this stage (prior to final design); however, this proposed WTP replaces the old, WTP and will presumably have comparable energy requirements, resulting in no net increase in energy consumption. Diesel fuel will be consumed whenever the permanent back-up generator is needed.

2.10 Future Modifications, Extensions, or Abandonment

The WTP is being designed to meet the foreseeable needs of the Town and its water use customers. Decommissioning of the new WTP is not anticipated in the foreseeable future. Repair and maintenance is intended to support the operation of the WTP indefinitely. Incremental replacement, upgrades of the infrastructure may be required in future years for continued effective operation or to conform to current standards and maintain regulatory compliance.

The demolition of the existing WTP will not be included as part of this EIA registration and will be addressed under a separate project once the new WTP is operational.

2.11 Accidents and Malfunctions

The project components will be designed or implemented in accordance with applicable Acts, regulations, guidelines, codes and standards for industrial plants, however, accidental events may still occur and some accidents may have significant consequences. To minimize environmental emergencies and health and safety risks, an Environmental Management Plan (EMP) and Emergency Response Plan (ERP) will be developed and implemented as part of the pre-construction planning. Accidental events may include but are not limited to:

- Hazardous Material, Chemical and Fuel spills;
- Traffic control and vehicle accidents;
- Discovery of Archaeological Resources or Human Remains; and,
- Fires.

2.11.1 Hazardous Material, Chemical and Fuel Spills

Malfunctions or accidents may result in spills of petroleum hydrocarbons, hazardous materials, or other substances during construction and operation of the project. Such spills may contaminate soils and groundwater and, through runoff, contaminate watercourses and wetlands. Contaminants may adversely affect surface water quality, fish and fish habitat, and wildlife habitat, including species of conservation concern.

2.11.1.1 Potential Risk

Aquatic and Terrestrial Habitat: During the Construction phase, there is potential for spills of hazardous materials used in the site preparation, fabrication and installation of the facilities. Chemical and fuel spills may enter the environment directly as a result of a motor vehicle accident, leaks from storage tanks or a release during construction or maintenance operations. Impacts could range from a small localized spill, which is contained and remediated quickly, to a large release of a highly soluble material that affects the receiving watercourse and downstream watersheds. Possible negative affects to the terrestrial environment, surface water/fish and fish habitat include direct mortality of wildlife, fish and aquatic organisms, and degradation of terrestrial environments, groundwater and surface water quality.

Public Health and Safety: During operations of the WTP, several hazards to human health are present. This includes the storage and usage of chemicals in the treatment process. Improper storage and handling of chemicals poses a risk to worker safety onsite.

2.11.2 Traffic Control and Vehicle Accidents

The potential for a vehicle accident or the interaction with local residents and recreational users has the potential to occur during construction and operation of the project.

2.11.2.1 Potential Risk

Public Health and Safety: During the construction and operational phases there will be an increase in traffic in and on the roads in the vicinity of the project. Traffic related to the construction of the WTP will consist of vehicles carrying works, dump trucks transporting fill, flatbed trucks and floats transporting equipment, supplies and materials.

Increased traffic in the area around the project during construction and operation could lead to a higher risk of traffic related accidents. These accidents may cause injury or death to persons involved and may damage property (vehicles or equipment) that could be costly to repair / replace.

2.11.3 Discovery of Archaeological Resources or Human Remains

A potential unexpected discovery of archaeological artifacts or human remains during construction has the potential to occur during construction and excavation activities.

2.11.3.1 Potential Risk

Loss or damage of valuable provincial artifacts and potential disturbance of burial sites.

2.11.4 Fire

Accidental fires could potentially be caused during construction or operation. During construction, sources of fire include hot exhaust or equipment, discarded cigarettes, or sparks.

Potential causes of fire during the operational phase include those listed above as well as from motor vehicle accidents, which result in fire.

2.11.4.1

Potential Risk

Terrestrial Environment: Fire may result in a loss of vegetation which has the potential to impact important riparian areas, wetland habitat, and migratory bird nesting areas as well as cause temporary and localized reduction in air quality.

Public Health and Safety: Smoke from a larger fire may reduce visibility and air quality to the point where the local residents and recreational users may be affected or at risk.