



**NB DEPARTMENT OF TOURISM,
HERITAGE and CULTURE**

**Parlee Beach Sewerage System
Condition Assessment**

PRELIMINARY DESIGN REPORT

Submitted by:

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Preface

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Executive Summary

Crandall Engineering Ltd. was retained by the NBDTHC to perform an assessment of the existing sanitary sewerage collection and pumping system at Parlee Beach located in the Pointe-du-Chêne LSD near the Town of Shediac in southeastern NB. The original system was constructed in 1974 and some components were upgraded in 1991.

Crandall performed field work consisting of CCTV videos and intrusive surveys of existing manholes as well as a condition assessment of the lift station including site visits and pump capacity testing. Records received from Parlee Beach operations personnel were reviewed and meetings and discussions took place with operations staff and an outside contractor.

It was found that the flows entering the facility were less than expected. This could indicate that there is exfiltration of wastewater in the sewerage collection system into the sandy soil but it is difficult to confirm this conclusively. During field testing in the Spring with high inflow, we would have expected flows entering the collection system, but little to no flow was noted. The pumps were also operating below design levels indicating pump wear or possible force main fouling.

The lift station facility is dated, does not have proper controls and back-up for power or mechanical failures and requires upgrading. It was also found that a residential service is connected to the system and this should be removed and transferred to the communal system operated by the Greater Shediac Sewerage Commission. A long section of the existing gravity sewer is located within the existing sand dune and maintenance will be difficult. Regardless of condition, consideration should be given to relocating this line and abandoning the existing.

There is risk of untreated sewage discharge to the existing coastal wetland at Parlee Beach. It is recommended that the existing overflow line here be removed as part of a lift station upgrade to include at a minimum a generator, wet well upsizing and controls improvements. The existing culvert at this location is undersized and a review of the outlet by NBDELG is recommended.

An upgrade of the lift station and collection system is recommended. Crandall considered 3 options for the overall upgrades for comparison. A key consideration for each is the presence of the coastal wetland. It is recommended that NBDTHC consider entering into discussions with the Greater Shediac Sewerage Commission for the operation and maintenance of the new system.

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1 Introduction

The Parlee Beach sanitary sewer system was originally constructed in 1974 and last upgraded in 1991 by the Province of NB. It is presently owned and operated by the NB Department of Tourism, Heritage and Culture (NBDHTC).

The objective of this study was to complete a condition assessment on the existing sanitary sewer system and lift station. The primary trigger for completing this study is to determine if upgrades to the system are required to protect the environment and receiving waters from the discharge or risk of future discharge of untreated wastewater in adjacent water bodies. As part of this project, Crandall was also asked to determine if any residential sanitary sewer services from the homes nearby in the Bluff area are connected to the Parlee Beach sanitary sewer system, and make recommendations to address this should it be the case. The general tasks completed as part of this study are listed below and are presented in the report:

- **Review of Existing Information:** The NBDTHC provided Crandall with record drawings and historic lift station pump hour meter data. This study also included several site visits by Crandall with Parlee Beach maintenance staff.
- **Existing Design Flows:** The theoretical sanitary sewer flows for the system were calculated and compared to present lift station capacity and historic pump hour meter data.
- **Intrusive Survey and Data Collection:** Crandall completed a topographic survey of manholes locations and intrusive survey of all infrastructure relevant to the project activities. This information was used to create a base plan of the existing conditions.
- **Condition Assessment:** Crandall determined the condition of the lift station, sewer mains using CCTV video inspection, manholes, overflow pipe and any other relevant infrastructure.
- **Options and Recommendations:** Crandall provided options for new upgrade and improvements.
- **Cost Estimates:** these are included herein for planning purposes and discussion.

2 Existing Conditions

2.1 Project Area

Parlee Beach Provincial Park is a popular tourist destination located in eastern Westmorland County fronting the Northumberland Strait in the Pointe-du-Chêne LSD near the Town of Shediac, located adjacent to the communities of the Bluff and Cap-Brulé.

The highlight of the site is its 1 km long sandy beach and warm waters. The facilities serviced for sanitary sewer comprise of washrooms, showers and a canteen on the east side, along with a restaurant and washroom building on the west side. It is approximately 500 m from the east buildings to the west buildings. These buildings are serviced by a sanitary sewerage collection system which consists of approximately 650 m of buried gravity sewer piping (total) and a sewerage lift station located on the south-east end of the development. A large portion of the existing sewerage collection system runs along a sand dune parallel with the beach.

The Parlee Beach lift station pumps the sewerage to the Greater Shediac Sewerage Commission (GSSC) sanitary sewer system in the Bluff community. The flows are ultimately directed to the GSSC wastewater treatment facility to the east of Parlee Beach in the Communauté Rurale Beaubassin Est (CRBE).

A coastal wetland (Provincially Significant Wetland) has a defined watercourse that discharges to the Northumberland Strait at the south side of the Parlee Beach. This watercourse presently receives the Parlee Beach lift station overflow pipe, a line that is designed to protect the sanitary sewer system from back-up and surcharging in times of operational failure or power outage. During these times, it could be discharging untreated wastewater to the watercourse and the Northumberland Strait at Parlee Beach.

There is an existing culvert at the coastal wetland downstream of the overflow pipe. Crandall will determine whether this culvert may be limiting the flow in the wetland downstream of the overflow pipe.

Figure 2-1 Project Area Overview



A detailed existing conditions drawing can be found in Appendix A, Drawing 17161-1P-C100.

2.2 Review of Available Information & Data

Crandall was provided with several sources of information related to the project scope. The following section summarizes the information provided and its relevance to this report:

2.2.1 As-Built Information

In 1991, the Province of NB completed an update to the Parlee Beach sewage lift station that had been originally constructed in 1974. This project had also included replacing small sections of gravity and force main connecting to the lift station. These record drawings were valuable in the establishment of a preliminary existing conditions plan, which was used in early iterations of the proposed alignment. Existing conditions were subsequently updated with data gathered during the field investigation program described in Section 2.3.

2.2.2 Break History and Records

Crandall requested records of breaks and operational failures from the Parlee Beach sewer system operators at the kick off meeting with regards to recent breaks or failures. **The Parks representatives indicated that there are no records of sewer piping or force main breaks and that to their knowledge these lines have never been flushed.**

It was also indicated by the Parlee Beach maintenance staff that the lift station pumps have no significant history of failures. It was noted that a local company performs annual maintenance at start and end of each seasonal operation. Crandall contacted this company and they indicated that they do start-up and shut down each season and assist the operators when they have issues but they do not produce records of their site visits or actions.

2.2.3 NB Power Records

Crandall was not provided with this information. As an alternate, we used the pump hourmeter data to estimate pump use.

2.2.4 Hour Meter Data

The present lift station is not equipped with a flow meter; however, the Parlee Beach maintenance staff record the hour meter data each day while the facility is in service. This was provided to Crandall by the NBDTHC. The Park provided the hour meter data for the 2016 season (July to September) and the month of August of 2015 only. No other records for a full season from prior years were made available to Crandall by Parlee Beach staff following our request, so only the 2016 data could be used for this analysis. The key comments and findings:

- The pumps operate less than 2 hours in a peak day and most days they will operate less than 1 hour in total;
- Several days, even in the peak season, show no pump use. It is not possible to determine whether this relates to the fact that operators did not record fractions of an hour or if in fact the run time was zero for those days. The hour meter was found to operate correctly at the time of the site visit and the hour meter provides fractions of hours (as x.xx hours). Some days do have the decimal point data recorded however.
- Hour meter data was not used for the drawdown test information in section 2.3.2 to determine an estimated flow volume that enters the lift station in a season. This test was performed using hand held stop watches.
- During the study period, Crandall visited the lift station several times and we found very little to no flow into the lift station (the study was done before the tourist season at Parlee Beach but this was in early Spring with some days of heavy rainfall).

2.3 Data Collection

As requested in the terms of reference for this assignment, Crandall administered a field data collection program which included:

- Site investigation and lift station assessment;
- Intrusive survey of underground structures;
- Sewer main video inspection;
- Sewage pump draw down test

These elements are described in further detail in the following sections:

2.3.1 Site Investigation and Lift Station Assessment

A site visit was conducted by Crandall with Parlee Beach maintenance personnel so that we can assess the present lift station, issues and locations of all related infrastructure.

Figure 2-1 Existing Parlee Beach Lift Station



Key observations of the lift station are as follows:

- The lift station includes two (2) self-priming sewage pumps in a duplex pump arrangement. The pumps alternate and the pump start and stop are determined by float switches in the wet well;
- The wet well is pre-cast concrete. It was difficult to determine its condition, but visually it did not show obvious signs of structural failure. It was found to provide a very “short” active volume however;
- Over time, the pumps have been adjusted to their maximum; therefore, pump wear plates and possibly impellers will need to be replaced the next time the pumps require clearance adjustment to maintain performance;
- Air valves do not seem to be functioning properly;
- No pressure gauge is installed in the building;
- PVC internal piping seems to be in good condition;
- A majority of the metal hardware is in poor condition (i.e. rails, ladders, supports, baffling of the inlet, etc);

- The access hatch does not have modern safety measure, such as a grating door;
- The float switch support bracket should be replaced;
- The building is in fair condition with signs of mold and evidence previous piping leaks;
- Alarms for pump failure are done with a red light on the outside of the building with no remote indication (autodialler or SCADA).

In general, the lift station is showing signs of age and typical wear a deterioration of aging lift station. It also lacks modern instruments and safety features found in present day lift station design such as flow meters, SCADA system (communications), pressure sensors, safe wet well access, accurate level sensors, backup of power and floatable baffle control device for the overflow pipe.

It should be noted that during the site visit, the pumps lost their prime and therefore had to be repaired to continue. It is not known whether this is a common occurrence or a unique event. It is possible that it was caused by pumping beyond the stop level during the test since the distance between the start and stop level and is very short. This was raised to the attention of the operator for continued monitoring.

2.3.2 Sewage Pump Drawdown Test

A sewage pump drawdown test was completed on the existing lift station. Due to the very low flows at this time of year it was required to bring in a water truck to fill the wet well in order to complete the test. The result of the draw down concluded that both pump #1 and pump #2 each pump 14-15 L/sec (222 to 238 USgpm) at a measured pump speed of 1,216 rpm.

The design pump capacity per pump (provided by the pump manual graph) is 20 L/sec (317 USgpm) at a pump speed of 1,200 rpm. Therefore, the pumps are operating at approximately 75% of initial design capacity.

This could be an indication that the pumps are becoming worn and are losing efficiency, and/or that the 1974 cast iron force main is becoming fouled or encrusted. There are no gauges in the facility to determine this either way.

2.3.3 Sewer Video Inspection and Manhole Intrusive Inspection

To understand the present condition of the existing sewage collection system, Crandall completed a manhole intrusive survey and retained a contractor to conduct a CCTV video sewer inspection. A complete overview of the existing sewerage collection system is included in Appendix A – Drawing 17161-1P-C100.

The CCTV sewer video inspection could access approximately 75% of the collection system, shown in blue on Drawing 17161-1P-C100. The remaining 25% was not able to be accessed with the robotic camera due to sediment in the line, shown in yellow on Drawing 17161-1P-C100.

A review of the video reports does not show significant signs of any pipe deterioration or infiltration. There are indications of sags in areas of the pipe and this could also be why silt and debris has accumulated in areas that can't be accessed, in particular given the system apparently has never been flushed (according to the Parlee Beach operations personnel).

However, it is possible there is sewer exfiltration though the joints in areas near the dunes since there was no flow whatsoever from the collection system to the lift station which is surprising given the area, the age of the piping and the wet ground conditions at the time of the site visits. Exfiltration was not able to be viewed in video inspections, but considering the soils in this area it is possible any leakage would be absorbed into the sand. We have noted that in some cases the downstream manhole flow was higher than the upstream manhole, which is unusual. We also noted surface water entering the manhole tops, but again no water was flowing to the wet well.

Flow metering could better define the presence or extent of the exfiltration issue, but this is outside the scope of this report.

Figure 2-3 is a snapshot from the video reports of a section in the dunes near the center. Figure 2-4 is a snapshot from the video reports of a section near the existing lift station. Figure 2-4 also show sign the pipe has been surcharged as stains and sludge is all the way to the top of the pipe.

Figure 2-3 Sewer video sample of section in the dunes.



Figure 2-4 Sewer video sample of section near Lift Station.



In addition to the sewer videos a manhole inspection and intrusive survey was completed. This involved using GPS to confirm top of manhole elevations and locations as well as inverts. As a result, pipe grades could be determined as shown on Drawing 17161-1P-C100.

In general, all sewer grades are within or greater than the minimum standard of 0.28% for 250mm diameter pipe in accordance with the 2016 Atlantic Canada Guidelines for Sanitary Sewer Collection, Pumping and Treatment (ACGSSCPT).

Figure 2-5 Typical Manhole at Dunes (MH2008)



Identified manholes were all constructed similar to the above Figure 2-5. Manhole construction appears to be a “dog house” style poured base with the top half of the pipe removed. Construction of the existing manhole sections are not typical to today’s standards as they have many joints leaving the system more susceptible to infiltration and/or exfiltration.

2.3.4 Residential Service on Parlee Beach Sewer System

Based on the intrusive manhole inspection, it was determined that a residential 100mm diameter service is connected to the Parlee Beach System from a residence in the Bluff area. The service discharge’s into MH2006 adjacent to the lift station, shown in Appendix A, Drawing 17161-1P-C100.

Figure 2-6 Residential Service



Where the Parlee Beach Sewer System is a private system (in particular if it were intended for seasonal operation only and is shut down in the winter), this residence should be removed from the Parlee Beach sanitary sewer system. **The residence appears to be of seasonal use, but this was not confirmed.** If the home were in service year-round, we estimate that approximately 200,000L of untreated wastewater could be directed to the coastal wetland via the overflow pipe.

During our inspection, the overflow pipe was plugged and the sewer system was not filling, and this would lead us to believe that the residence was unoccupied through the winter months. It was not occupied on the day of inspection. Even if the Parlee Beach system were to operate year-round, we would recommend that this residence be removed from the private system.

2.3.5 Lift Station Overflow

The overflow is intended to function as a relief should the pumps fail, become overwhelmed by flow or if the station should lose power. Since Parlee Beach Provincial Park is seasonal, the park shuts down the lift station during the winter months. As a result, if any inflow or infiltration or unknown connections remain on the system, this would be discharged to the wetland.

The lift station overflow pipe is a 250mm diameter corrugated metal pipe (CMP) that enters the lift station at an elevation of -0.251m geodetic and discharges into the adjacent watercourse at the coastal wetland. At the end of the submerged overflow pipe there is a flap gate installed to prevent any backflow from the watercourse to enter the lift station. Upon first inspection of the overflow pipe inside the wet well it was dry. Therefore, the flap gate is not leaking. Further inspection of the submerged overflow pipe indicated that the discharge end is almost completely buried in sediment and clay material.

Given the age and materials of this pipe, it is highly likely that it is corroded (despite attempts, we were unable to CCTV video inspect the line and it could not be seen from the surface). This can be seen in figure 2-7 below.

Figure 2-7 Overflow Discharge



2.3.6 Tidal Watercourse and Wetland

The tidal watercourse and wetland located on the south side of the Parlee Beach is a Provincially Significant Wetland (PSW) according to Service NB Mapping. The watercourse is shown in yellow in Appendix A – Drawing 17161-1P-C100 also showing is 30m buffer.

The existing condition of the water course appears to be stagnant water with very little tidal flushing. The water enters and discharges depending on the tide from the Northumberland Strait through a series of narrow channels and a culvert near the lift station outfall that discharges into the watercourse. It was observed that the inlet of the watercourse appears to have been narrowed by a combination of Rip Rap along the shore and sand dunes that have formed as seen in Figure 2-8.

Figure 2-8 Watercourse Inlet



2.3.7 Culvert at Tidal Watercourse

Within the watercourse in the provincially significant wetlands there is a 1500mm diameter corrugated steel pipe (CMP) culvert. The culvert location can be seen on Drawing 17161-1P-C100 and Figure 2-9 shown bellow.

Figure 2-9 Culvert at Tidal Watercourse



Crandall performed a preliminary sizing of the culvert and have determined that the 1500mm diameter culvert is undersized. The preliminary sizing was based on the surrounding drainage area using LiDAR information.

The culvert is presently half full of sediment that is potentially restricting its capacity as a full 1500mm diameter pipe as modeled. As a result, it is limiting the flow from the incoming and outgoing tides within the watercourse and the surrounding drainage basin. It is also assumed, as for most CMP culverts of this age, that the bottom of the pipe may be corroded and deteriorating. We were unable to confirm this based on the site observations.

It should be noted that analysis of the flushing of the inlet lagoon is outside the scope of this report. This item should be referred to the NBDELG for comment.

3 Upgrades and Improvements

The following outlines recommended upgrades and improvements for the various components in the Parlee Beach Sanitary Sewer System:

3.1 Existing Lift Station

The existing lift station is dated and needs upgrading. The NBDTHC would have the option to upgrade the various components, including the building, pumps, piping and controls or to replace the facility completely with more state of the art components. In both cases, the recommended upgrades will be significant and the cost of a new facility will be close to upgrading using the existing components. **A facility replacement would allow using submersible pumps which are easier to operate and maintain. This would likely be the preferred pump type of the GSSC should they be asked to operate the facility.** As explained in 3.2, a new generator should be added.

3.2 Existing Overflow

It is recommended that the existing overflow pipe from the lift station to the adjacent wetland be removed or at least filled with concrete and abandoned, but only if done with a major lift station upgrade. As a minimum, a new stand-by generator, a larger wet well and new controls would be required at the lift station to maintain it in operation during power outages. Crandall considered having a single generator set that could operate the Parlee Beach water system and sewage lift station, but due to the distance between both systems, this would not be feasible.

3.3 Existing Forcemain

The pump testing data indicates that the pumps are operating below design conditions. This could either be caused by the pumps themselves or due to encrustation of the existing 1974 forcemain. This could be evaluated further in the design phase of this project to determine the condition of this pipe. **However, given its age, at this stage we will include the cost of replacing this line as part of recommended work, but this may not be required once the design is advanced.** It should be noted that it appears that the pipe is presently running through a lot without easements, but this would require further analysis at the design stage.

3.4 Existing Sewerage Piping System

There are 2 key considerations in analysing the condition of the sewerage collection system:

- A large part of the piping is located within an existing sand dune and is difficult to maintain and repair should this be required;
- As noted previously, there is a possibility that there is exfiltration of the pipe. However, given the highly variable use of this facility and limited flow / pump use records, it is difficult to verify this by comparing actual to theoretical flows. It is also difficult to observe this type of problem in the field.

As a next step, the NBDTHC could perform flow metering to quantify possible exfiltration. However, given its proximity to the existing sand dunes and the age of the piping, the NBDTHC may decide to relocate the existing gravity sewer and abandon the existing, in particular, the dunes section. Pipe relining was considered but this was not found to be feasible given the small quantity in this project.

3.5 Remove Residential Service

As described in Section 2.3.5, it is recommended that the residential service connected to the Parlee Beach system be relocated to the GSSC sewer system along Satinwood Avenue.

A preliminary field investigation of the residential service indicated that this could be done either with a shallow insulated service or a private sewage pump for the resident to pump the residential flows to the above noted sanitary manhole location. This would depend on the plumbing inside the home and this should be defined at the detailed design stage.

3.6 New Culvert at Coastal Wetland Watercourse

It is recommended that the existing 1,500 mm diameter culvert be replaced with two (2) 1800mm diameter culverts and that the design of this upgrade be done to minimize siltation and to improve tidal flow and flushing of the watercourse. This work would require WAWA (if not EIA) permitting and would be recommended to be completed in the off season as it would affect vehicle traffic through the park. The full analysis of the flushing of the watercourse is outside the scope of this report.

3.7 NBDELG Review Coastal Wetland Outlet

It is also recommended that the NBDTHC contact the NBDELG to further study possible impacts on the tidal inlet of this watercourse noted in section 2.3.6. It is presently not clear if the restriction at the inlet was caused by the rip-rap and development in this area or by natural causes. This is outside of the scope of this study. In any case, we recommend removing the sewer overflow to eliminate any sewage connection at this wetland, but only if done in conjunction with a major improvement / upgrade of the lift station.

4 Cost Estimates

There are different options to consider that will require additional consideration at the detailed design phase. Preliminary commentary on these options is provided in the following sections:

4.1 OPTION 1 – New Lift Station and Gravity Sewer to GSSC Lift Station

This option would separate the sanitary system into two separate discharge locations into the GSSC sewer system. A new 200mm PVC diameter sewer would be installed on the west side of the beach to collect the Parlee Beach Restaurant and the adjacent canteen and washrooms. This pipe would be horizontally directionally drilled across the (PSW) and connected to the GSSC Lift Station No. 10 in Point-du-Chêne at minimum grade.

The east side of the beach would be renewed from the canteen, washrooms and life guard building with a new 200mm diameter PVC sewer. The east side sewer basin would discharge into a new lift station (or upgrade) located in the same location as the existing lift station. The existing forcemain would be replaced and relocated to the GSSC sanitary manhole SAMH-12 (See Appendix A, Drawing 17161-1P-C101).

Advantages

- Abandonment of sanitary sewer system along sand dunes;
- Reduce flow to new lift station;
- Realignment of forcemain for better access for maintenance and repair;
- Ease of service connections from west side building using the existing sewer alignments and renewing sewer in existing trench;
- Long term protection of new infrastructure by moving closer inland;

Disadvantages

- Wetland permits for horizontal directional drilling across watercourse (PSW);
- Easements required along alignment to GSSC Lift Station No. 10;
- Horizontal drilling can be risky in the soil type expected at this location.

4.1.1 OPTION 2 – New Lift Station and Gravity Sewer

This option would renew the present gravity system with a new 200mm diameter PVC sewer and move the present sewer pipe along the dunes further inland. Moving the sewer inland will protect the infrastructure from any potential long term coastal erosion and improve access for maintenance purposes. The renewed gravity sewer would then discharge to a new lift station in the same location as existing. The existing forcemain would be replaced and relocated to the GSSC sanitary manhole SAMH-12. See Appendix A, Drawing 17161-1P-C102.

Advantages

- Abandonment of sanitary sewer system along sand dunes;
- Realignment of forcemain for better access for maintenance and repair;
- Ease of service connections from west side building using the existing sewer alignments and renewing sewer in existing trench;
- Long term protection of new infrastructure by moving closer inland;
- All flows from Parlee Beach are not required to be pumped by the GSSC Lift Station No. 10;
- Lower risk given horizontal directional drilling is not required;
- Little to no construction impact on wetland.

Disadvantages

- More restoration required.

4.1.2 OPTION 3 – Gravity Sewer only to GSSC Lift Station

This option would convey all flows from the Parlee Beach by gravity to the GSSC Lift Station No.10. This work would include horizontal directional drilling across the (PSW) and decommissioning of the of the existing Parlee Beach lift station. This option would also require extensive modification to the existing GSSC Lift Station No. 10 and a deep sewer and wet well install. See Appendix A, Drawing 17161-1P-C103.

Advantages

- Abandonment of sanitary sewer system along sand dunes.

- No new lift station required;
- Long term protection of new infrastructure by moving closer inland;
- Less maintenance of Parlee Beach infrastructure.

Disadvantages

- Deep Excavation and deep new wet well for Lift Station #10;
- Major upgrade of GSSC lift station is required;
- More restoration required;
- Wetland permits for horizontal directional drilling across watercourse (PSW);
- Easements required along alignment to GSSC Lift Station No. 10.;
- Highest risk given deep excavations and horizontal directional drilling.

4.2 Preliminary Cost Estimates

To assist the NBDTHC in budgeting of capital works assignments, a preliminary cost estimate was completed for the three (3) options above for a new sewer alignment. The completed cost estimate includes (depending on option) pipe installation, trench reinstatement, new watercourse culverts, new lift stations, abandonment of existing infrastructure, removal and relocation of residential service, rock excavation, directional drilling, engineering and contingencies where appropriate. **The total preliminary cost estimate for each option are as follows:**

OPTION 1 – \$1,278,400 + HST

OPTION 2 – \$1,396,050 + HST

OPTION 3 – \$1,515,975 + HST

A detailed breakdown has been included in **Appendix B**.

The estimates are preliminary only, done without field surveys or geotechnical investigations and do not include land acquisition costs or easements. Cost estimates were completed in 2017 dollars and will need to be adjusted to reflect future cost increases. Due to the preliminary nature of the engineering (done without surveys, geotechnical investigations, etc.), cost estimates include a contingency allowance of 15%, an allowance for engineering and environmental approvals, but excludes HST.

The costs presented previously include an allowance of approximately \$140,000 + HST for the culvert replacement with the remainder being the sewer system costs. This is detailed in the estimates found in Appendix B.

RECOMMENDATION:

Given the comparison of advantages and disadvantages and the risk profile of the three (3) options, the NBDTHC should discuss the three (3) options with the NBDELG and determine which option better fits its requirements for approvals and long-term operations approach. Each options has advantages and disadvantages, and all three (3) are possible. It would be possible to complete this work in phases.

4.3 Regulatory, Approvals, Land and Schedule

4.3.1 Wetland and Watercourse Alteration (WAWA) Permit

A Wetland and Watercourse Alteration (WAWA) permit is required whenever work is planned within 30 m of a watercourse or wetland area. This project will require a WAWA permit through the NBDELG.

4.3.2 Environmental Impact Assessment (EIA)

An Environmental Impact Assessment (EIA) is a process that allows the Province to evaluate the environmental impacts of a project that meets certain triggers. If a project triggers the requirement for an EIA, the proponent must submit the required information to allow for a Determination Review of the project by the Province. Given the work would be performed within a Provincially Significant Wetland (PSW), it should be discussed early in the design stage with the NBDELG to determine whether EIA screening is required for this project. The fact that the work is proposed to improve and protect the PSW should be seen as being positive in this process.

4.3.3 Greater Shediac Sewerage Commission (GSSC)

Approvals from the GSSC will be required, in particular in the options where new connections to the Commission's existing system are required. Discussions with the GSSC will be required for the removal of the residential service.

4.3.4 Schedule

It is recommended that this work be performed in the off season. Should the design commence in the Summer of 2017, this would allow tendering of the work in late-Summer for construction in the Fall and Winter depending on the regulatory process and approvals. This would permit the new system to be in operation early in the 2018 season.

4.3.5 Land

It appears that most of the land on which the proposed work will take place is under the name of the NB Economic Development and Tourism or the NB Natural Resources and Energy. It does not appear that the forccemain is on land owned by the Province of NB. It is recommended that a detailed search of land ownership and easements be performed in the area to ensure that the Province of NB has the proper easements and land for the work.

5 Conclusions and Recommendations

1. The Parlee Beach sanitary sewer system needs upgrading to meet present-day standards. Based on the field work and analysis performed herein, the existing lift station needs an upgrade as the present facility is aging and lacks modern controls and remote communications needed should a failure take place during a peak use day at Parlee Beach. Presently, if there is a pump failure, the untreated wastewater is directed to the Shediac Bay via the overflow pipe.
2. A large portion of the existing sewerage piping system is in a sand dune and this system dates back to 1974. The sewer video does not show any structural problems with this system, but observations indicate that there may be a sewer exfiltration issue given the sandy soil. It is recommended that this system, in particular within the existing dunes, be replaced.
3. There is an existing sewer overflow pipe from the lift station to a Provincially Significant Wetland (PSW). We recommend this line be removed but only with a major upgrade of the lift station including a stand-by generator, new controls and a larger wet well.
4. There is an existing home connected to this system. It is not clear whether this home is seasonal or of year-round use, but given the fact that the Parlee Beach system is seasonal, the private home should be removed from the system and transferred to the Greater Shediac Sewerage Commission system. At present, should this home ever be used in the winter months, its wastewater would be directed untreated to the environment.
5. The existing culvert at the PSW is undersized and may need to be upgraded. The NBDTHC should communicate with the NBDELG on the possible obstructions at the outlet end of the PSW at Parlee Beach.
6. The NBDTHC should perform a review of land ownership and easements to ensure that its systems are on its land. For example, it does not appear that the forcemain is on Province of NB land, but this should be verified.
7. Crandall developed 3 possible options for the upgrading of this system and these options are shown in Appendix A. They have been compared on cost as well as technical advantages and disadvantages.
8. The preliminary cost estimates for the system upgrades described herein ranges from approximately \$1.3 Million to \$1.5 Million + HST. Depending on approvals and if the design commences promptly, this work should be constructed in late-2017 and early-2018 so that it is in service for the 2018 tourist season.

APPENDIX A - PRELIMINARY DRAWINGS



G:\CADD\SHEDIAC\DEPT OF TOURISM\17161-1 OVERALL SITE PLAN.DWG 25/07/2017 10:48 AM

NOTES

- VIDEO INSPECTED
- UNABLE TO ACCESS WITH VIDEO INSPECTION (FLUSHING REQUIRED)

NO.	DATE	REVISIONS	BY	APPR.
01	JULY 25/17	ISSUED FOR FINAL REPORT	AC	MGC
00	JUNE 5/17	ISSUED FOR REPORT	AC	MGC

**NB DEPT OF
TOURISM,
HERITAGE AND
CULTURE**



PRELIMINARY ONLY
DO NOT PROCEED WITH CONSTRUCTION

PROJECT TITLE
**PARLEE BEACH SEWAGE SYSTEM
CONDITION ASSESSMENT**

SHEDIAC N.B.
DRAWING TITLE
**OVERALL SITE PLAN
EXISTING CONDITIONS**

Scale (1:1000 FULL SCALE)	Drawn By	Design By
	Checked By	Cadd Check
	Sheet	1 of 4

File Name
PARLEE BEACH

Drawing No.
17161-1P-C100



G:\CAD\SHEDIAC\NB DEPT OF TOURISM\17161-1 OVERALL SITE PLAN - OPTION 1.DWG 25/07/2017 10:47 AM

NOTES

1. OPTION INCLUDES REMOVAL OF OVERFLOW PIPE AND ANY POSSIBLE CONNECTION TO WATERCOURSE DISCOVERED DURING DETAIL DESIGN.

01	JULY 25/17	ISSUED FOR FINAL REPORT	AC	MGC
00	JUNE 5/17	ISSUED FOR REPORT	AC	MGC
NO.	DATE	REVISIONS	BY	APPR.

**NB DEPT OF
TOURISM,
HERITAGE AND
CULTURE**



PRELIMINARY ONLY
DATE PLOTTED: 25/07/2017
NOT TO BE USED FOR CONSTRUCTION

PROJECT TITLE
**PARLEE BEACH SEWAGE SYSTEM
CONDITION ASSESSMENT**

SHEDIAC N.B.
DRAWING TITLE
**OVERALL SITE PLAN
(OPTION 1)**

Scale	Drawn By	Design By
10m 0 20m (1:1000 FULL SCALE)	AC	MGC
	Checked By	Card Check
	MGC	TWA
	Sheet	2 of 4

File Name
PARLEE BEACH

Drawing No.
17161-1P-C101



G:\CAD\SHEDIAC\NB DEPT OF TOURISM\17161-1 OVERALL SITE PLAN - OPTION 2.DWG 25072017 10:48 AM

NOTES

1. OPTION INCLUDES REMOVAL OF OVERFLOW PIPE AND ANY POSSIBLE CONNECTION TO WATERCOURSE DISCOVERED DURING DETAIL DESIGN.

01	JULY 25/17	ISSUED FOR FINAL REPORT	AC	MGC
00	JUNE 5/17	ISSUED FOR REPORT	AC	MGC
NO.	DATE	REVISIONS	BY	APPR.

NB DEPT OF
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HERITAGE AND
CULTURE



PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

PROJECT TITLE
**PARLEE BEACH SEWER SYSTEM
CONDITION ASSESSMENT**

SHEDIAC N.B.
DRAWING TITLE
**OVERALL SITE PLAN
(OPTION 2)**

Scale	Drawn By	Design By
10m 0 20m (1:1000 FULL SCALE)	AC	MGC
	Checked By	Cadd Check
	MGC	TWA
	Sheet	3 of 4

File Name
PARLEE BEACH

Drawing No.
17161-1P-C102



G:\CADD\SHEDIAC\NB DEPT OF TOURISM\17161-1 OVERALL SITE PLAN - OPTION 3.DWG 25/07/2017 10:44 AM

NOTES

1. OPTION INCLUDES REMOVAL OF OVERFLOW PIPE AND ANY POSSIBLE CONNECTION TO WATERCOURSE DISCOVERED DURING DETAIL DESIGN.

01	JULY 25/17	ISSUED FOR FINAL REPORT	AC	MGC
00	JUNE 5/17	ISSUED FOR REPORT	AC	MGC
NO.	DATE	REVISIONS	BY	APPR.

**NB DEPT OF
TOURISM,
HERITAGE AND
CULTURE**



PRELIMINARY ONLY
THIS PROJECT MAY BE USED FOR CONSTRUCTION

PROJECT TITLE
**PARLEE BEACH SEWAGE SYSTEM
CONDITION ASSESSMENT**

SHEDIAC N.B.
DRAWING TITLE
**OVERALL SITE PLAN
(OPTION 3)**

Scale	Drawn By	Design By
10m 0 20m (1:1000 FULL SCALE)	AC	MGC
	Checked By	Cadd Check
	MGC	TWA
	Sheet	4 of 4

File Name
PARLEE BEACH

Drawing No.
17161-1P-C103

APPENDIX B - PRELIMINARY COST ESTIMATES



Parlee Beach Sewage System Condition Assessment
Option No.1
PRELIMINARY COST ESTIMATE - June 1, 2017
Project No.17161-1

Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Cost
SECTION No. 3 - DUST CONTROL, SILT FENCE AND EROSION CONTROL					
1.	Silt Fence and Erosion/Environmental Control Structure, Complete	lump sum	1	\$20,000.00	\$20,000.00
SECTION No. 4 - SANITARY SEWER SYSTEMS					
2.	New Sanitary Sewer Mains, 200mm dia. PVC DR-35 incl. fittings, couplings, caps, connections and by-passing of flows, complete	lin. m.	345	\$260.00	\$89,700.00
3.	New 100mm dia. Service Connections, Complete	lump sum	1	\$5,000.00	\$5,000.00
4.	Insulation, Complete	sq.m.	50	\$65.00	\$3,250.00
5.	New 1050mm dia. Manholes	unit	5	\$7,000.00	\$35,000.00
6.	Abandonment of Existing Sewer pipes, forcemain, Overflow pipe and Manholes	lump sum	1	\$18,000.00	\$18,000.00
7.	Connection and Wet Well modification to Lift Station No. 10	lump sum	1	\$10,000.00	\$10,000.00
8.	New Horizontally directional drilled 200mm dia.Sanitary HDPE DR-11 (Gravity sewer) , incl. fittings, restraints, couplings, by-passing of flows and test connections, complete	lin. m.	110	\$1,000.00	\$110,000.00
SECTION No. 5 - SANITARY PRESSURE PIPE SYSTEMS					
9.	New 150mm dia DR28 Forcemain (Open Excavation) incl. fittings, restraints, couplings, by-passing of flows and test connections, complete	lin. m.	90	\$220.00	\$19,800.00
SECTION No. 6 - TRENCHING, BEDDING, BACKFILLING, RESTORATION AND MAINTENANCE					
10.	Trench Excavation in Rock, Complete	cu.m.	500	\$90.00	\$45,000.00
SECTION No. 7 - ROADBED CONSTRUCTION					
11.	Aggregate Base - 0-31.5mm Crushed Rock, Complete	tonne	250	\$20.00	\$5,000.00
SECTION No. 8 - ASPHALT CONCRETE PAVING, RESURFACING, PATCHING AND RESTORATION					
12.	Asphalt, c/w Tack Coat, Complete				
a)	Asphalt Base Type "B", 60 mm Thick	tonne	40	\$300.00	\$12,000.00
b)	Asphalt Seal Type "D", 40 mm Thick	tonne	10	\$350.00	\$3,500.00
SECTION No. 9 - CONCRETE CURB & GUTTER AND SIDEWALKS					
13.	New Concrete Curb & Gutter, Complete	lin.m.	20	\$95.00	\$1,900.00
14.	New 2.0 Wide Concrete Sidewalks, Complete	sq.m.	220	\$105.00	\$23,100.00
SECTION No. 13 - IMPORTED TOPSOIL AND Sod					
15.	Imported Topsoil and Sod, Complete	sq. m.	2,500	\$15.00	\$37,500.00
SECTION No. 14 - CULVERT PIPES AND RIP-RAP EROSION CONTROL					
16.	New 1800mm culverts, Including Restoration, Complete	lin.m.	45	\$2,250.00	\$101,250.00
17.	R25 Rip-Rap c/w Non-Woven Geotextile Fabric	tonne	100	\$50.00	\$5,000.00
SECTION No. 15 - SANITARY LIFT STATIONS					
18.	New Bollards, Complete	unit	2	\$1,200.00	\$2,400.00
19.	2100 mm Dia. Pre-Cast Wet Well for Lift Station, Including Lean Concrete Mud Slab and Sand Cushion, Benching, Flat Top Cover, Locking Hatch, Shoring, Drop Bowl Assembly, Pipe Penetration Seals, Complete	unit	1	\$40,000.00	\$40,000.00
20.	Structural Engineered Fill Backfill Material for Wet Well, Including Site Grading and Shaping, Complete	tonne	200	\$30.00	\$6,000.00
21.	Lift Station Foundation, Structural and Architectural, Complete	lump sum	1	\$70,000.00	\$70,000.00
22.	Mechanical Systems for Sanitary Lift Station, Including Submersible Pumps, Piping, Fittings and Accessories, Ventilation, Flow Meters, Valves, Lifting Davit, Chain Hoist, Complete	lump sum	1	\$140,000.00	\$140,000.00
23.	Electrical for Sanitary Lift Station, Including Stand by Generator, Variable Frequency Drives, SCADA Programming and Accessories, Complete	lump sum	1	\$150,000.00	\$150,000.00
24.	Decommissioning and disposal of Existing Lift Station and Wet Well, Complete	lump sum	1	\$25,000.00	\$25,000.00
				SUB-TOTAL:	\$978,400.00
				Contingency Allowance Engineering and Environmental Approvals Allowance	\$150,000.00
				SUB-TOTAL:	\$1,278,400.00
				HST @ 15 %:	\$191,760.00
				GRAND TOTAL:	\$1,470,160.00



Parlee Beach Sewage System Condition Assessment
Option No.2
PRELIMINARY COST ESTIMATE - June 1, 2017
Project No.17161-1

Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Cost
SECTION No. 3 - DUST CONTROL, SILT FENCE AND EROSION CONTROL					
1.	Silt Fence and Erosion/Environmental Control Structure, Complete	lump sum	1	\$20,000.00	\$20,000.00
SECTION No. 4 - SANITARY SEWER SYSTEMS					
2.	New Sanitary Sewer Mains, 200mm dia. PVC DR-35 incl. fittings, couplings, caps, connections and by-passing of flows, Complete	lin. m.	625	\$260.00	\$162,500.00
3.	New 100mm dia. Service Connections, Complete	lump sum	1	\$5,000.00	\$5,000.00
4.	Insulation, Complete	sq.m.	50	\$65.00	\$3,250.00
5.	New 1050mm dia. Manholes	unit	9	\$7,000.00	\$63,000.00
6.	Abandonment of Existing Sewer pipes, focemain, Overflow pipe and Manholes	lump sum	1	\$18,000.00	\$18,000.00
SECTION No. 5 - SANITARY PRESSURE PIPE SYSTEMS					
7.	New 150mm dia DR28 Forcemain (Open Excavation) incl. fittings, restraints, couplings, by-passing of flows and test connections, complete	lin. m.	90	\$220.00	\$19,800.00
SECTION No. 6 - TRENCHING, BEDDING, BACKFILLING, RESTORATION AND MAINTENANCE					
8.	Trench Excavation in Rock, Complete	cu.m.	1,000	\$90.00	\$90,000.00
SECTION No. 7 - ROADBED CONSTRUCTION					
9.	Aggregate Base - 0-31.5mm Crushed Rock, Complete	tonne	250	\$20.00	\$5,000.00
SECTION No. 8 - ASPHALT CONCRETE PAVING, RESURFACING, PATCHING AND RESTORATION					
10.	Asphalt, c/w Tack Coat, Complete				
a)	Asphalt Base Type "B", 60 mm Thick	tonne	60	\$300.00	\$18,000.00
b)	Asphalt Seal Type "D", 40 mm Thick	tonne	20	\$350.00	\$7,000.00
SECTION No. 9 - CONCRETE CURB & GUTTER AND SIDEWALKS					
11.	New Concrete Curb & Gutter, Complete	lin.m.	150	\$95.00	\$14,250.00
12.	New 2.0 Wide Concrete Sidewalks, Complete	sq.m.	220	\$105.00	\$23,100.00
SECTION No. 13 - IMPORTED TOPSOIL AND Sod					
13.	Imported Topsoil and Sod, Complete	sq. m.	4,500	\$15.00	\$67,500.00
SECTION No. 14 - CULVERT PIPES AND RIP-RAP EROSION CONTROL					
14.	New 1800mm culverts, Including Restoration, Complete	lin.m.	45	\$2,250.00	\$101,250.00
15.	R25 Rip-Rap c/w Non-Woven Geotextile Fabric	tonne	100	\$50.00	\$5,000.00
SECTION No. 15 - SANITARY LIFT STATIONS					
16.	New Bollards, Complete	unit	2	\$1,200.00	\$2,400.00
17.	2100 mm Dia. Pre-Cast Wet Well for Lift Station, Including Lean Concrete Mud Slab and Sand Cushion, Benching, Flat Top Cover, Locking Hatch, Shoring, Drop Bowl Assembly, Pipe Penetration Seals, Complete	unit	1	\$40,000.00	\$40,000.00
18.	Structural Engineered Fill Backfill Material for Wet Well, Including Site Grading and Shaping, Complete	tonne	200	\$30.00	\$6,000.00
19.	Lift Station Foundation, Structural and Architectural, Complete	lump sum	1	\$70,000.00	\$70,000.00
20.	Mechanical Systems for Sanitary Lift Station, Including Submersible Pumps, Piping, Fittings and Accessories, Ventilation, Flow Meters, Valves, Lifting Davit, Chain Hoist, Complete	lump sum	1	\$160,000.00	\$160,000.00
21.	Electrical for Sanitary Lift Station, Including Stand by Generator, Variable Frequency Drives, SCADA Programming and Accessories, Complete	lump sum	1	\$150,000.00	\$150,000.00
22.	Decommissioning and disposal of Existing Lift Station and Wet Well, Complete	lump sum	1	\$25,000.00	\$25,000.00
				SUB-TOTAL:	\$1,076,050.00
				Contingency Allowance	\$160,000.00
				Engineering and Environmental Approvals Allowance	\$160,000.00
				SUB-TOTAL:	\$1,396,050.00
				HST @ 15 %:	\$209,407.50
				GRAND TOTAL:	\$1,605,457.50



Parlee Beach Sewage System Condition Assesement
Option No.3
PRELIMINARY COST ESTIMATE - June 1, 2017
Project No.17161-1

Item No.	Description	Unit	Estimated Quantity	Unit Price	Total Cost
SECTION No. 3 - DUST CONTROL, SILT FENCE AND EROSION CONTROL					
1.	Silt Fence and Erosion/Environmental Control Structure, Complete	lump sum	1	\$30,000.00	\$30,000.00
SECTION No. 4 - SANITARY SEWER SYSTEMS					
2.	New Sanitary Sewer Mains, 200mm dia. PVC DR-35 incl. fittings, couplings, caps, connections and by-passing of flows, Complete	lin. m.	610	\$260.00	\$158,600.00
3.	New 100mm dia. Service Connections, Complete	lump sum	1	\$5,000.00	\$5,000.00
4.	Insulation, Complete	cu.m.	100	\$65.00	\$6,500.00
5.	New 1050mm dia. Manholes	unit	9	\$7,000.00	\$63,000.00
6.	Abandonment of Existing Sewer pipes, focemain, Overflow pipe and Manholes	lump sum	1	\$18,000.00	\$18,000.00
7.	New Horizontally directional drilled 200mm dia.Sanitary HDPE DR-11 (Gravity sewer) , incl. fittings, restraints, couplings, by-passing of flows and test connections. Complete	lin. m.	110	\$1,000.00	\$110,000.00
SECTION No. 6 - TRENCHING, BEDDING, BACKFILLING, RESTORATION AND MAINTENANCE					
8.	Trench Excavation in Rock, Complete	cu.m.	1,800	\$90.00	\$162,000.00
SECTION No. 7 - ROADBED CONSTRUCTION					
9.	Aggregate Base - 0-31.5mm Crushed Rock, Complete	tonne	300	\$20.00	\$6,000.00
SECTION No. 8 - ASPHALT CONCRETE PAVING, RESURFACING, PATCHING AND RESTORATION					
10.	Asphalt, c/w Tack Coat, Complete				
a)	Asphalt Base Type "B", 60 mm Thick	tonne	80	\$300.00	\$24,000.00
b)	Asphalt Seal Type "D", 40 mm Thick	tonne	30	\$350.00	\$10,500.00
SECTION No. 9 - CONCRETE CURB & GUTTER AND SIDEWALKS					
11.	New Concrete Curb & Gutter, Complete	lin.m.	150	\$95.00	\$14,250.00
12.	New 1.5 Wide Concrete Sidewalks, Complete	sq.m.	75	\$105.00	\$7,875.00
SECTION No. 13 - IMPORTED TOPSOIL AND Sod					
13.	Imported Topsoil and Sod, Complete	sq. m.	5,000	\$15.00	\$75,000.00
SECTION No. 14 - CULVERT PIPES AND RIP-RAP EROSION CONTROL					
14.	New 1800mm culverts, Including Restoration, Complete	lin.m.	45	\$2,250.00	\$101,250.00
15.	R25 Rip-Rap c/w Non-Woven Geotextile Fabric	tonne	100	\$50.00	\$5,000.00
SECTION No. 15 - SANITARY LIFT STATIONS					
16.	New 2400 mm Dia. Pre-Cast Wet Well for Lift Station No.10, Including Lean Concrete Mud Slab and Sand Cushion, Benching, Flat Top Cover, Locking Hatch, Shoring, Drop Bowl Assembly, Pipe Penetration Seals, Complete	unit	1	\$100,000.00	\$100,000.00
17.	Structural Engineered Fill Backfill Material for Wet Well, Including Site Grading and Shaping, Complete	tonne	300	\$30.00	\$9,000.00
18.	Upgrade Mechanical Systems for Sanitary Lift Station No.10, Including Submersible Pumps, Piping, Fittings and Accessories, Ventilation, Flow Meters, Valves, Lifting Davit, Chain Hoist, Complete	lump sum	1	\$160,000.00	\$160,000.00
19.	Electrical for Sanitary Lift Station, upgrades, Complete	lump sum	1	\$75,000.00	\$75,000.00
20.	Decommissioning and disposal of Existing Lift Station and Wet Well, Complete	lump sum	1	\$25,000.00	\$25,000.00
				SUB-TOTAL:	\$1,165,975.00
				Contingency Allowance	\$175,000.00
				Engineering and Environmental Approvals Allowance	\$175,000.00
				SUB-TOTAL:	\$1,515,975.00
				HST @ 15 %:	\$227,396.25
				GRAND TOTAL:	\$1,743,371.25

APPENDIX C - SEWER VIDEO INSPECTION REPORTS

Tel:
Fax:
E-mail:





Inspection Report

Date 19-May-17	P/O. No.	Weather Dry	Surveyor's Name Mitchell Gallant	Pipe Segment Reference	Section No. 5
Certificate No. U-1115-07000676	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Parlee Beach Shediac Easement/Right of way	Use of Sewer Drainage Area Flow Control Length surveyed	Sanitary 109.12 m	Upstream MH Downstream MH Dir. of Survey Section Length	MH2005 MH2006 Downstream 113.10 m
--	---	--	--	--	--

Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Maintenance Related 2	Joint Length Dia./Height Material Lining Method	200 mm Asbestos Cement
--	--	--	-----------------------------------

Add. Information :

1:468 Position	Observation	
0.00	Water Level, 5 %of cross sectional area	
MH2005 0.01	Upstream Manhole, Survey Begins / MH2005	
9.73	S1 Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, , within 200mm of joint: NO, Start	9.73 m
11.21	F1 Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, , within 200mm of joint: NO, Finish	
11.21	Survey Abandoned / Debris,near reversal point	16 m
11.21	Remarks: ***** Combined *****	
11.21	Remarks: Inspection continued from other side	
11.21	Remarks: Uninspected length: 3.976 m	
15.19 97.91	↑Remarks: Inspection continued from other side	21.89 m
15.19 97.91	↑Remarks: ***** Combined *****	
15.19 97.91	↑Survey Abandoned / Debris	
16.00 97.10	↑Deposits Settled Fine, 25 %of cross sectional area, from 04 to 08 o'clock, , within 212mm of joint: NO	
17.07 96.03	↑Water Level, 20 %of cross sectional area	65.92 m
21.89 91.21	↑Deposits Settled Fine, 10 %of cross sectional area, from 05 to 07 o'clock, , within 212mm of joint: NO	
58.54 54.56	↑Water Level, 5 %of cross sectional area	



City :
Tel:
Fax:
Email:

Inspection Report

Date :	Job number :	Weather : Dry	Operator : Mitchell Gallant	Counter : 5	Section name :
Present :	Vehicle :	Camera :	Preset :	Cleaned : No Pre-Cleaning	Rate :

1:468	Position	Observation					
		<p>↑ Water Level, 15 %of cross sectional area</p> <p>↑ Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, , within 212mm of joint: YES</p> <p>↑ Water Level, 5 %of cross sectional area</p> <p>↑ Water Level, 15 %of cross sectional area</p> <p>↑ Water Level, 5 %of cross sectional area</p> <p>↑ Downstream Manhole, Survey Begins / MH2006</p>					
	<p>64.30 48.81</p> <p>65.92 47.18</p> <p>94.17 18.94</p> <p>102.47 10.63</p> <p>113.10 0.00</p> <p>MH2006 113.10 0.00</p>						
QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	3200	0	6	6	0	3	3



Tel:
Fax:
E-mail:

Inspection photos

City : Shediac	Street : Parlee Beach	Date :	Pipe Segment Reference :	Section No : 5
--------------------------	---------------------------------	--------	--------------------------	--------------------------



Photo: 5_5_37_A.JPG, VCR No.: 2
9.73m, Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, ,
within 200mm of joint: NO, Start



Photo: 4_4_33_A.JPG, VCR No.: 2
16m, Deposits Settled Fine, 25 %of cross sectional area, from 04 to 08 o'clock, ,
within 212mm of joint: NO



Tel:
Fax:
E-mail:

Inspection photos

City : Shediac	Street : Parlee Beach	Date :	Pipe Segment Reference :	Section No : 5
--------------------------	---------------------------------	--------	--------------------------	--------------------------



Photo: 4_4_31_A.JPG, VCR No.: 2
21.89m, Deposits Settled Fine, 10 %of cross sectional area, from 05 to 07 o'clock, ,
within 212mm of joint: NO



Photo: 4_4_28_A.JPG, VCR No.: 2
65.92m, Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, ,
within 212mm of joint: YES

Tel:
Fax:
E-mail:

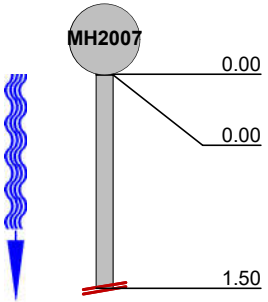
Inspection Report


Date 19-May-17	P/O. No.	Weather Dry	Surveyor's Name Mitchell Gallant	Pipe Segment Reference	Section No. 6
Certificate No. U-1115-07000676	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Parlee Beach Shediac Easement/Right of way	Use of Sewer Drainage Area Flow Control Length surveyed	Sanitary 1.50 m	Upstream MH Downstream MH Dir. of Survey Section Length	MH2007 MH2006 Downstream 1.50 m
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Maintenance Related 2	Joint Length Dia./Height Material Lining Method	200 mm Asbestos Cement
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Add. Information :

1:50	Position	Observation
	0.00	Water Level, 20 %of cross sectional area
	0.00	Upstream Manhole, Survey Begins / MH2007
	1.50	Survey Abandoned / Unable to pass debris/sand- unable to perform reversal due to water level in MH2006



1.5 m

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0



Tel:
Fax:
E-mail:

Inspection photos

City : Shediac	Street : Parlee Beach	Date :	Pipe Segment Reference :	Section No : 6
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Photo: 7_7_63_A.JPG, VCR No.: 2
1.5m, Survey Abandoned

Tel:
Fax:
E-mail:

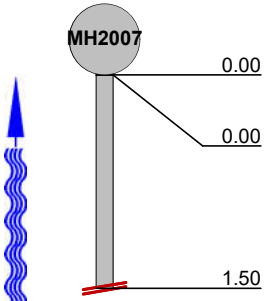
Inspection Report

Date 19-May-17	P/O. No.	Weather Dry	Surveyor's Name Mitchell Gallant	Pipe Segment Reference	Section No. 7
Certificate No. U-1115-07000676	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Parlee Beach Shediac Easement/Right of way	Use of Sewer Drainage Area Flow Control Length surveyed	Sanitary 1.50 m	Upstream MH Downstream MH Dir. of Survey Section Length	MH2007A MH2007 Upstream 1.50 m
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Maintenance Related 2	Joint Length Dia./Height Material Lining Method	200 mm Asbestos Cement
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Add. Information :

	1:50 Position	Observation
		Downstream Manhole, Survey Begins / MH2007
		Water Level, 25 % of cross sectional area
		Survey Abandoned / Debris/sand

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Tel:
Fax:
E-mail:

Inspection Report

Date 19-May-17	P/O. No.	Weather Dry	Surveyor's Name Mitchell Gallant	Pipe Segment Reference	Section No. 13
Certificate No. U-1115-07000676	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Parlee Beach Shediac Easement/Right of way	Use of Sewer Drainage Area Flow Control Length surveyed	Sanitary 114.37 m	Upstream MH Downstream MH Dir. of Survey Section Length	MH2009 MH2008 Downstream 115.00 m
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Maintenance Related 2	Joint Length Dia./Height Material Lining Method	300 mm Asbestos Cement
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Add. Information :

1:915 Position	Observation	
0.00	Upstream Manhole, Survey Begins / MH2009	
0.00	Water Level, 5 %of cross sectional area	
9.78	Survey Abandoned / Reversal complete	
9.78	Remarks: ***** Combined *****	
9.78	Remarks: Inspection continued from other side	
9.78	Remarks: Uninspected length: 0.631 m	
10.41 104.59	↑Remarks: Inspection continued from other side	
10.41 104.59	↑Remarks: ***** Combined *****	
10.41 104.59	↑Survey Abandoned / camera slipping	
76.11 38.89	↑Water Level, 10 %of cross sectional area	
81.15 33.86	S1 ↑Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, , within 212mm of joint: NO, Finish	
86.87 28.13	↑Water Level, 15 %of cross sectional area	
92.38 22.62	F1 ↑Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, , within 212mm of joint: NO, Start	
115.00 0.00	↑Water Level, 5 %of cross sectional area	
115.00 0.00	↑Downstream Manhole, Survey Begins / MH2008	



Tel:
Fax:
E-mail:

Inspection photos

City : Shediac	Street : Parlee Beach	Date :	Pipe Segment Reference :	Section No : 13
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Photo: 9_9_73_A.JPG, VCR No.: 2
92.38m, Deposits Settled Fine, 15 %of cross sectional area, from 05 to 07 o'clock, ,
within 212mm of joint: NO, Start

Tel:
Fax:
E-mail:

Inspection Report

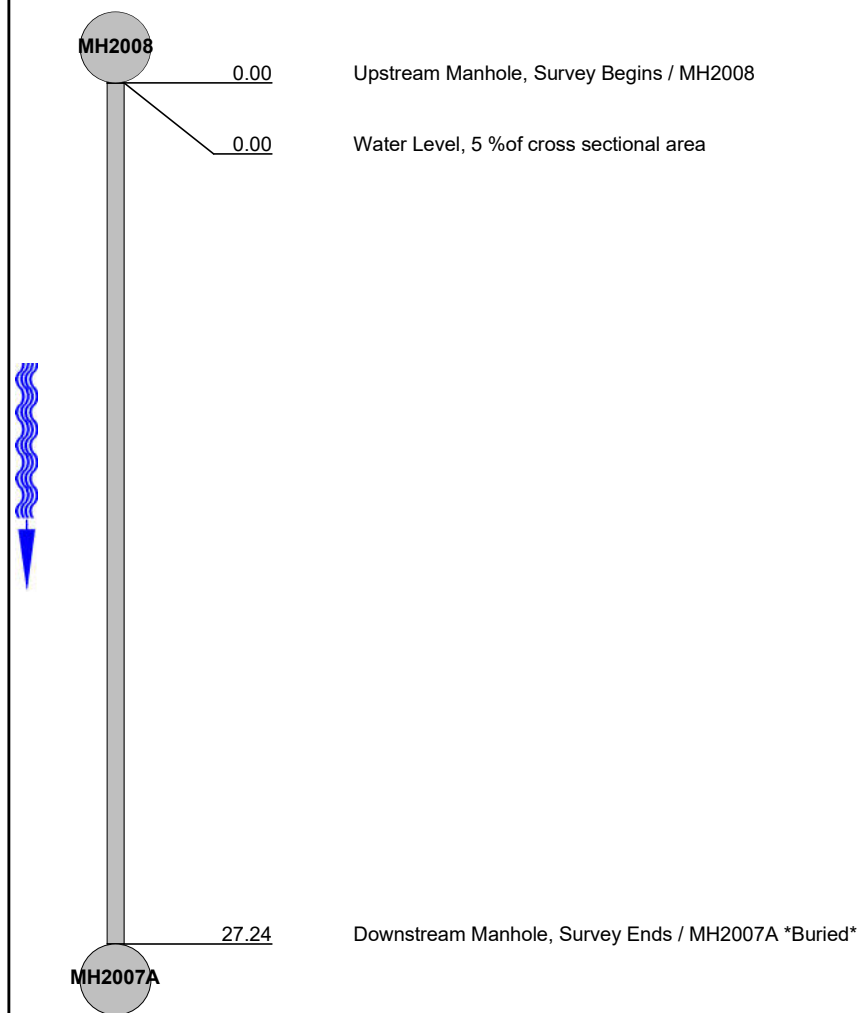
Date 19-May-17	P/O. No.	Weather Dry	Surveyor's Name Mitchell Gallant	Pipe Segment Reference	Section No. 9
Certificate No. U-1115-07000676	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Parlee Beach Shediac Easement/Right of way	Use of Sewer Drainage Area Flow Control Length surveyed	Sanitary 27.24 m	Upstream MH Downstream MH Dir. of Survey Section Length	MH2008 MH2007A Downstream 27.24 m
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Maintenance Related 2	Joint Length Dia./Height Material Lining Method	 300 mm Asbestos Cement
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Add. Information :

1:225 Position Observation



QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	0000	0	0	0	0	0	0

Tel:
Fax:
E-mail:

Inspection Report

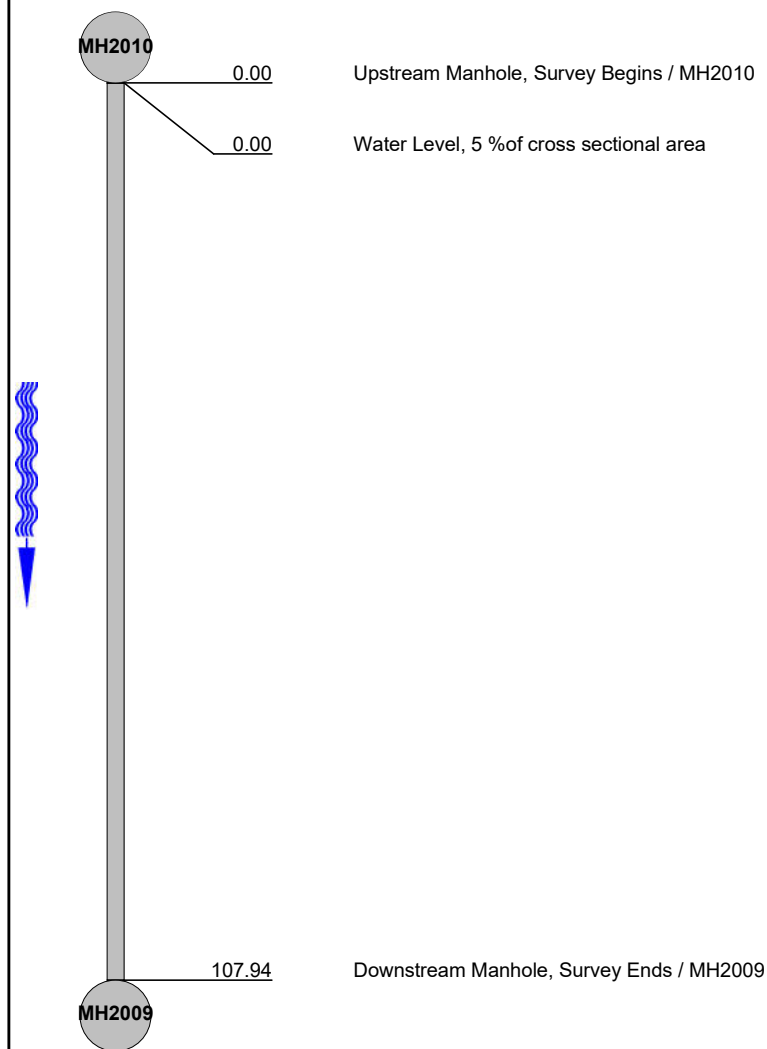
Date 19-May-17	P/O. No.	Weather Dry	Surveyor's Name Mitchell Gallant	Pipe Segment Reference	Section No. 11
Certificate No. U-1115-07000676	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Parlee Beach Shediac Easement/Right of way	Use of Sewer Drainage Area Flow Control Length surveyed	Sanitary 107.94 m	Upstream MH Downstream MH Dir. of Survey Section Length	MH2010 MH2009 Downstream 107.94 m
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Maintenance Related 2	Joint Length Dia./Height Material Lining Method	300 mm Asbestos Cement
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Add. Information :

1:855 Position Observation



QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
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Tel:
Fax:
E-mail:

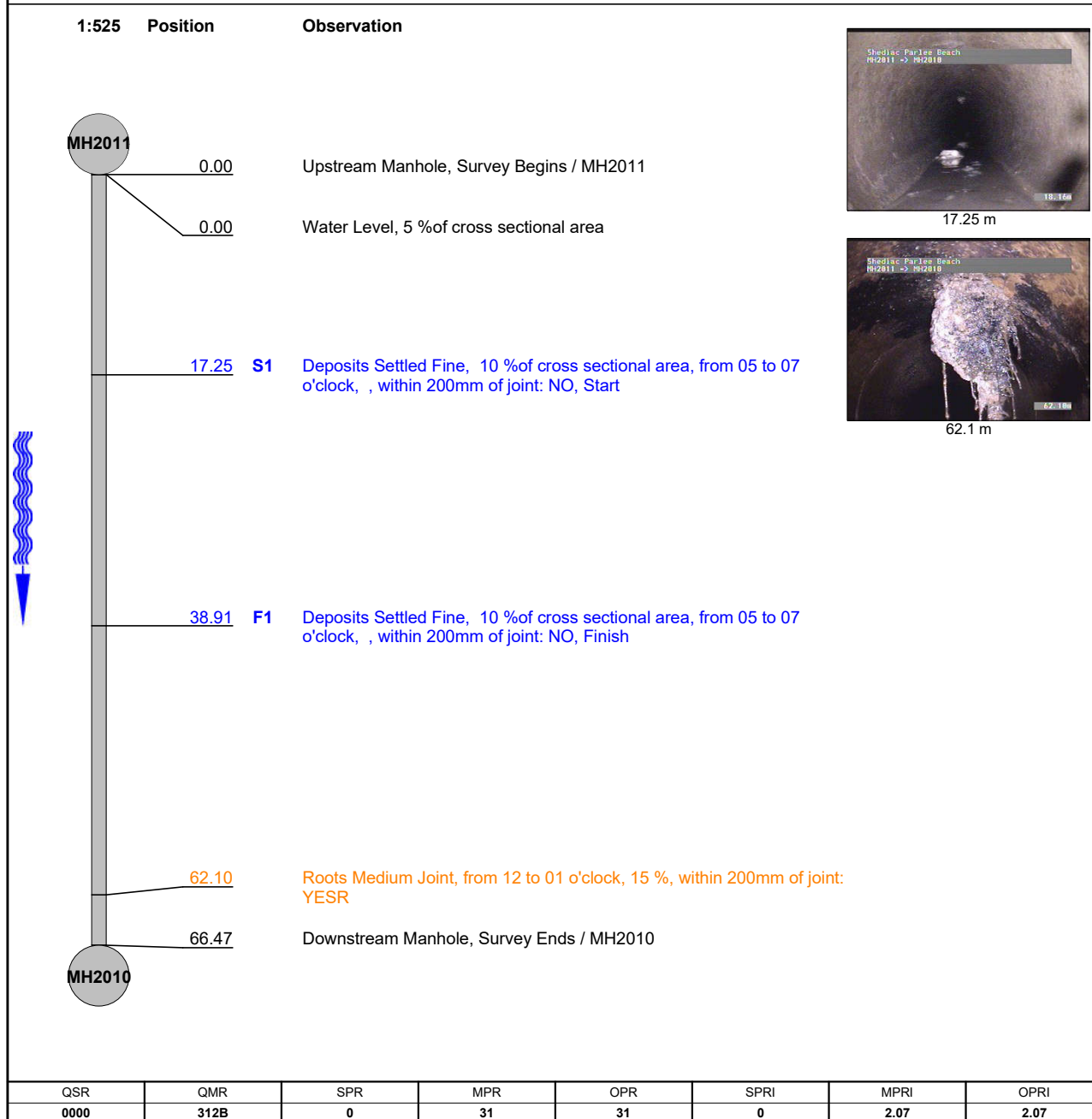
Inspection Report

Date 19-May-17	P/O. No.	Weather Dry	Surveyor's Name Mitchell Gallant	Pipe Segment Reference	Section No. 10
Certificate No. U-1115-07000676	Survey Customer	System Owner	Date Cleaned	Pre-Cleaning No Pre-Cleaning	Sewer Category

Street123 City Loc. details Location Code	Parlee Beach Shediac Easement/Right of way	Use of Sewer Drainage Area Flow Control Length surveyed	Sanitary 66.47 m	Upstream MH Downstream MH Dir. of Survey Section Length	MH2011 MH2010 Downstream 66.47 m
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Purpose of Survey Year Laid Year Rehabilitated Tape / Media No.	Maintenance Related 2	Joint Length Dia./Height Material Lining Method	300 mm Asbestos Cement
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Add. Information :



QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
0000	312B	0	31	31	0	2.07	2.07



Tel:
Fax:
E-mail:

Inspection photos

City : Shediac	Street : Parlee Beach	Date :	Pipe Segment Reference :	Section No : 10
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Photo: 11_11_84_A.JPG, VCR No.: 2
17.25m, Deposits Settled Fine, 10 %of cross sectional area, from 05 to 07 o'clock, ,
within 200mm of joint: NO, Start



Photo: 11_11_86_A.JPG, VCR No.: 2
62.1m, Roots Medium Joint, from 12 to 01 o'clock, 15 %, within 200mm of joint: YESR