Construction Air Quality Assessment
Credit River Active Transportation Bridge
North of Lakeshore Boulevard

City of Mississauga

SLR Project No: 241.30176.00000

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1.0 INTRODUCTION

SLR Consulting (Canada) Ltd., was retained by HDR Inc. on behalf of the City of Mississauga to conduct a construction air quality assessment for an active transportation bridge crossing over Credit River north of Lakeshore Road as part of the Class Environmental Assessment for Lakeshore Road & Royal Windsor Drive improvement in Mississauga.

The proposed site spans approximately 290 m in length, located east of Port Credit Railway Bridge. Section 2.0 provides a summary of typical sources of emissions from construction activities and common control measures. This construction air quality assessment identifies sensitive receptor locations within 500 m of the construction activities, proposed project works relative to identified sensitive receptors, recommendations for Best Management Practices (BMPs) and the types of BMPs that should be employed. An overview of specific construction areas and identified sensitive receptors are provided in Section 3.0.

2.0 SOURCE IDENTIFICATION AND CONTROL MEASURES

In general, the emission sources and control measures for construction activities are identified in the Environment and Climate Change Canada publication *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities*[1].

2.1 FUGITIVE DUST FROM VEHICLE MOVEMENT

2.1.1 PAVED ROADS

The most significant source of dust emissions from construction activities is typically from vehicular traffic on unpaved roads or open construction areas. Emissions from paved roads can also occur, typically due to material spillage, the transportation of uncovered material, or from dirty equipment. Additionally, paved roads surrounding a construction area can become dirty if left unattended, and vehicular traffic on these roads can cause the re-suspension of dust.

Mitigation and control measures to reduce dust emissions from paved surfaces include:

- Street sweeping as required, based on visual inspection. Roads should be kept clear of dust as much as possible.
- Swift removal of spilled materials.
- Use of enclosed cargo holds on trucks and vehicles or cover of open bodied trucks.
- Minimize or limit the number of trucks accessing the site.
- Clean the wheels and empty cargo holds of vehicles prior to leaving the site.

2.1.2 UNPAVED ROADS AND EXPOSED SURFACES

Dust from unpaved roads and exposed construction sites will occur due to vehicle travel as well as wind erosion. The predominant mechanism of dust generation from unpaved roads is the re-suspension of surface particulate due to vehicle traffic.

Mitigation and control measures to minimize fugitive dust from unpaved areas include:

- Minimize vehicle traffic on-site.
- Set low speed limits (i.e., 15 km/hr or less) for on-site traffic.
- Apply water or a dust suppressant on unpaved surfaces, including all roads and lots.
- Vegetating disturbed lands (e.g., seed disturbed lands) to reduce potential for dust to develop from exposed soil.

[1] Cheminfo Services Inc., Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities, March 2005

2.2 DUST FROM STORAGE OF MATERIALS AND RESIDUAL WASTE

2.2.1 STORAGE

Dust generation occurs from wind erosion of storage piles. Dust generation due to these activities is increased during strong wind conditions.

Mitigation and control measures to control fugitive dust from aggregate material and earth storage include:

- Minimize uncovered storage of materials on-site.
- Apply water or a dust suppressant to storage piles.
- Construct wind breaks surrounding storage piles.

2.2.2 UNLOADING AND LOADING

Loading, unloading, and transferring materials is a significant source of fugitive dust. Dust generation due to these activities is increased during strong wind conditions. Mitigation and control measures for unloading, loading, and transferring aggregate materials include:

- Minimize the amount of material being transferred on-site at any one time.
- Lower drop distances when unloading material onto piles or surfaces.
- Load trucks and vehicles so that the dump load will not spill over the sides of the target vehicle. Loads should be dropped as close to the vehicle opening as possible.
- Apply a water spray or dust suppressant to the materials being transferred.
- Cover loads when hauling or transferring materials.

2.3 ON-SITE OPERATIONS

2.3.1 MACHINERY EXHAUST

All diesel operated vehicles and machinery including generators, excavators, crushers, etc., will emit suspended particulate matter and odours as part of exhaust emissions. Higher amounts of particulate emissions can be expected during long idling times and when many vehicles or engines are operating at any one time.

Mitigation and control measures to control particulate matter and odours from engine exhaust include:

- Minimize the number of vehicles and engines operating concurrently.
- Increase separation distances between sensitive receptors, such as schools, residences, and parks and all exhaust points
- When possible, ensure that engine exhausts are oriented upwards.
- Limit idle times of vehicles and engines and shut off engines when not in use.

- When possible, limit operations to times when winds are blowing away from sensitive receptors and minimize use when winds would direct exhaust gases towards sensitive receptors.
- Ensure equipment and vehicles are well-maintained and in good working order.

2.3.2 EXCAVATION

Drilling, blasting, crushing, and excavating during construction are all sources of fugitive dust. Mitigation and control measures to minimize fugitive dust from excavation operations include:

- Minimize the number of machines operating concurrently.
- Use water or dust suppressants on the work surface
- Decrease the travel distance between the work area and storage piles or trucks.
- Lower drop distances of the excavated earth and materials.

2.4 DEMOLITION AND DECONSTRUCTION

Demolition activities such as bridge reconstruction can result in fugitive dust emissions resulting from blasting or removal of structures. In addition to the measures described above, mitigation measures for demolition and deconstruction include:

- Applying deconstruction techniques, rather than demolition.
- Minimize drop heights for debris.
- Enclose chutes and cover bins.
- Vacuum debris from paved and other surfaces prior to conducting reconstruction activities.
- Avoid prolonged storage of debris onsite.

3.0 SITE SPECIFIC CONSTRUCTION CONSIDERATIONS

3.1 METEOROLOGY

Based on the project site's unique location over the river and near Lake Ontario, twenty years of meteorological data (1990 to 2020) from the nearby Billy Bishop Toronto City Airport was utilized for the analysis. The annual wind rose is shown in Figure 1. The wind rose shows the wind direction (blowing from) and wind speed along the various compass directions. The site-specific review and recommendations consider this meteorological data.

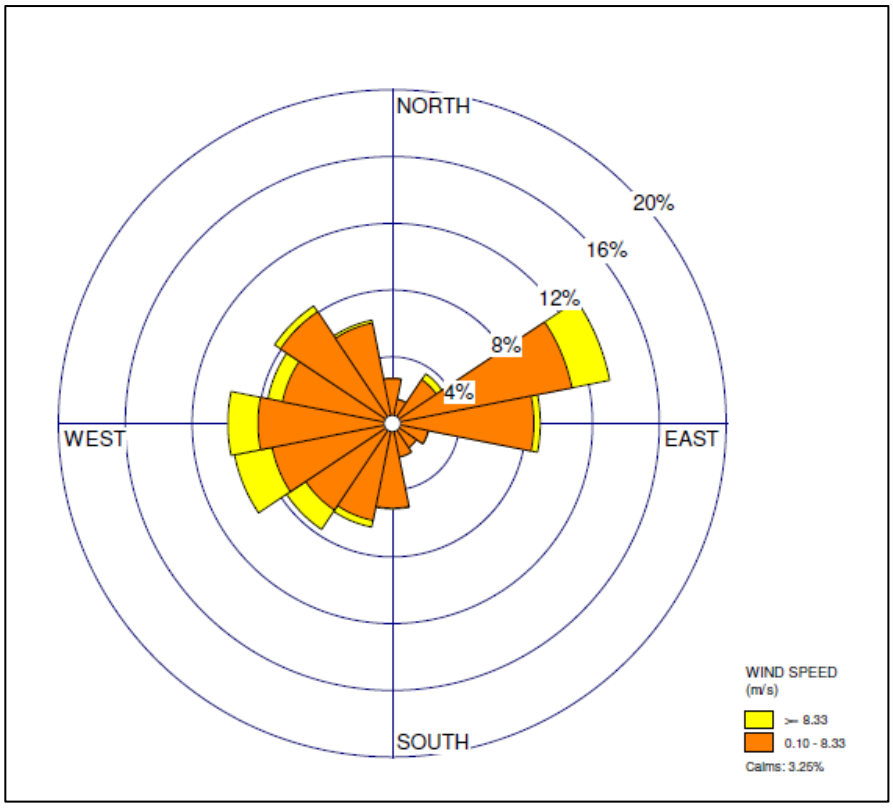

Figure 1: Annual Wind Rose for Billy Bishop Toronto City Airport (1990–2020)

3.2 IDENTIFICATION OF SENSITIVE RECEPTORS

shows the identified sensitive receptor locations within 500 meters of the study area. As can be seen in this image, within the buffer are mainly residential houses west of Port Credit Railway Bridge, with a mixture of commercial buildings and residential houses on the east side. Four churches and five education facilities also qualified as sensitive receptors.

shows the identified sensitive receptor locations within 500 meters of the study area. As can be seen in this image, within the buffer are mainly residential houses west of Port Credit Railway Bridge, with a mixture of commercial buildings and residential houses on the east side. Four churches and five education facilities also qualified as sensitive receptors.

Figure 2: Identified Sensitive Receptors Within the Study Area

3.3 BRIDGE CONSTRUCTION OVER CREDIT RIVER

As part of the roughly 60 m bridge spanning across the Credit River, a two-way cycling trail will extend from the riverbank to approximately 170 m further south toward Mississauga Road. Accordingly, Front Street will be realigned a few meters to the southeast to make room for said cycling trail, putting this phase of the construction within 20 m of the nearest residential houses, which are located immediately to the east as shown in Figure 3. The nearest receptors to the west are the houses located approximately 60 m away, on the other side Port Credit Railway Bridge and behind natural foliage. Immediately to the north side of the river is a skatepark and an ice rink dome (

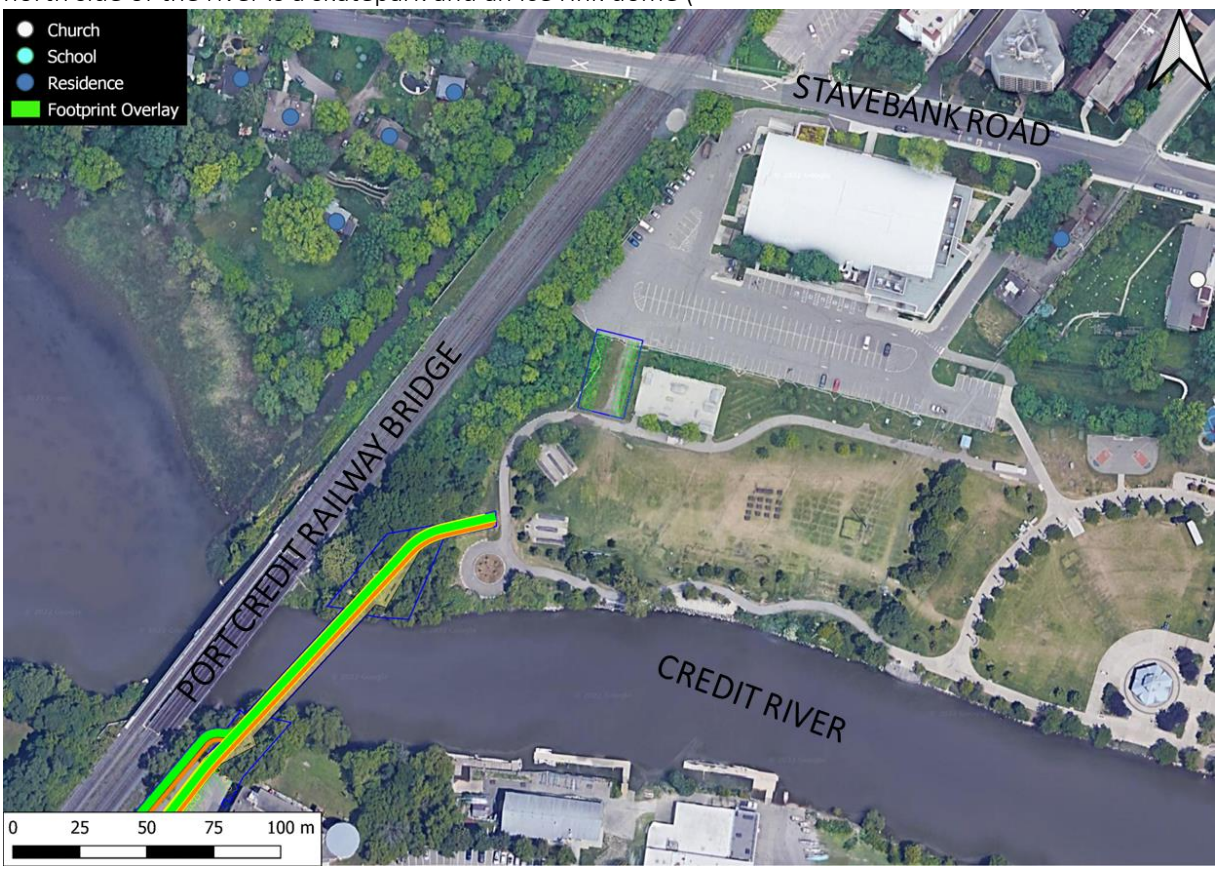

Figure 4).

From an air quality perspective, it is recommended that precautionary and mitigation approaches be considered when operating in close proximity to the identified sensitive receptor locations. The greatest potential for impacts would occur on dry and/or windy days, particularly when the winds are blowing from the west through northwesterly to north directions. During such meteorological events, consideration should be given to limiting or postponing operations that create fugitive dust emissions. As per guidance from the Ministry of Environment, Conservation and Parks (MECP), it is recommended that non-chloride dust suppressants be applied for all excavation, drilling and unpaved vehicle track movements to minimize fugitive dust. Regular cleaning of the construction site and vehicles and maintenance of equipment should be undertaken, as per the recommendations of 2.0.

Considerations should also be given to locating construction staging and storage areas away from identified receptors for both the south and north sides of the Credit River.

Figure 3: Critical Receptors South of Credit River (marked as stars)

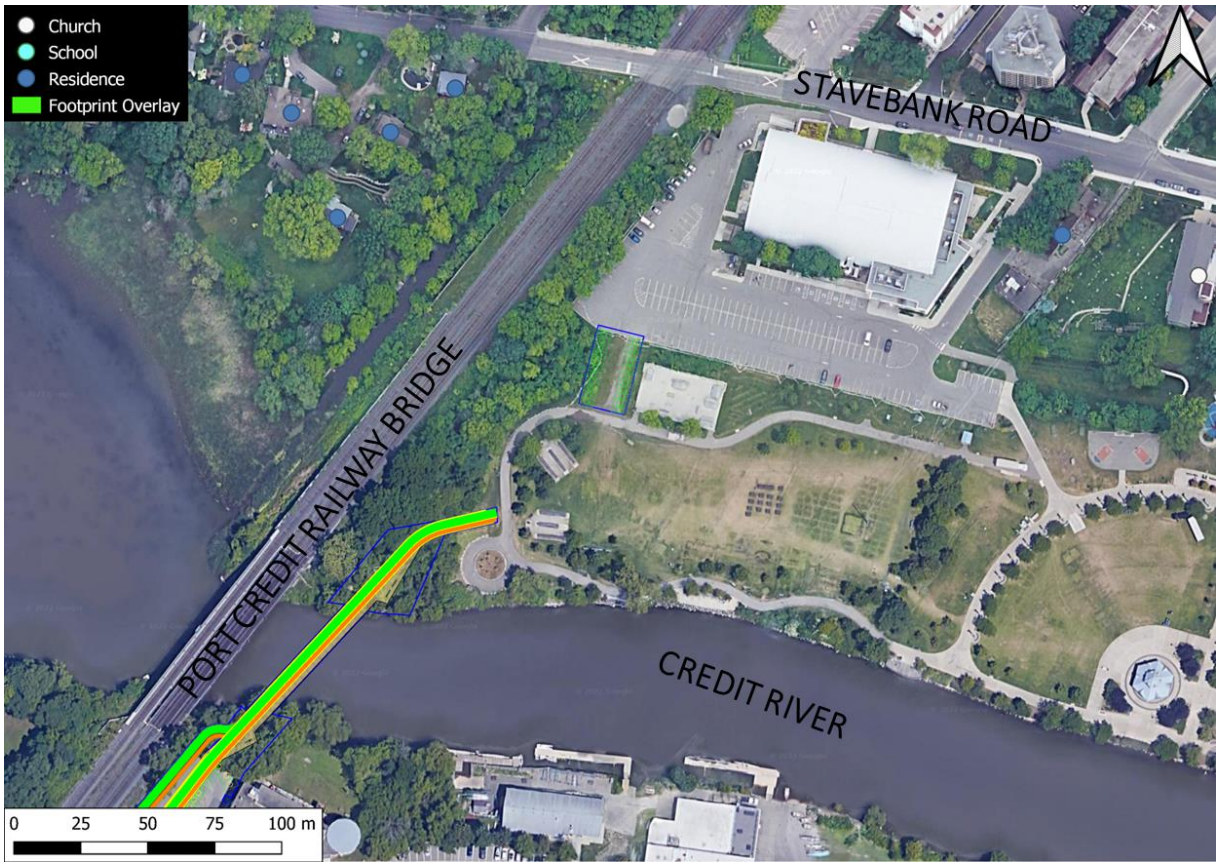

Figure 4: Receptors North of Credit River

4.0 DEVELOPMENT & IMPLEMENTATION OF A BEST MANAGEMENT PRACTICES PLAN (BMPP)

4.1 PURPOSE

It is the contractor's responsibility to ensure their staff and operating procedures follow a project-specific Best Management Practices Plan (BMPP) to reduce pollutants that contribute to poor air quality and ground level ozone formation. Given the unique nature of each construction project, contractors must develop and follow a BMPP specific to each project. The following sections provide a general overview/reference for the contract administrator as a guidance to look for or to step in promptly in the unlikely scenario the contractor appears to not operate under a BMPP during the project.

4.2 INTRODUCTION

A project specific BMPP should be developed before the start of construction and be followed for the duration of all construction activities. The BMPP can also be used as a tool for staff training and should remain in effect for the life of the construction job with the understanding that the plan will be reviewed and updated periodically by the contractor. The following conditions should be followed by designated construction managers and personnel:

- The BMPP is to be kept on file in the site office and available for review upon request.
- Training of relevant staff on new and existing operating procedures.
- Refresher training a minimum of once every year.
- Management is to communicate the BMPP to responsible personnel, who should ensure staff are following operating procedures defined in the BMPP.
- The site manager is responsible for ensuring the BMPP is followed.
- Management should ensure BMPP is reviewed as required.

5.0 STAFF TRAINING

All construction staff should be trained to follow the BMPP efficiently and safely. Training manuals should be prepared and reviewed with existing staff and new hires, as well as prior to the start of the construction project to identify site-specific measures to be implemented. The plan should be updated from time to time as required.

All employees directly involved with activities relating to the highway upgrades are to be trained in the following:

- Housekeeping requirements.
- Importance of following the BMPP.
- Procedures for control of dust and odour.
- Record keeping procedures.
- Reporting adverse conditions that have the potential to cause dust or odour to the site manager.

The construction manager should maintain a written record of employee training, including the date of training, the name and signature of the employee, and a description of the training received.

Trained personnel are to be present during construction activities to supervise receiving, handling, transfer of materials, and all other relevant site operations.

6.0 INSPECTION, MONITORING, RECORD KEEPING, AND REPORTING

A record keeping procedure should be implemented by the contractor to track daily information. Records are to be kept by the contractor's designated individual responsible for completing daily site inspections. The designated individual should be trained in the requirements and objectives of the BMPP. All records are to be kept on-site at the site office. Reporting will include:

- Confirmation that the inspection has been completed and that the items on the checklist have been addressed.
- Weather conditions, such as wind speed and direction, cloud cover, precipitation, and temperature.
- Any actions taken to control nuisance issues on-site.
- A summary of any on-site spills that were reported to the MECP.
- A summary of complaints received.

6.1 COMPLAINT PROCEDURE

The construction manager should ensure that all formal complaints are recorded, kept on file, and addressed. When a formal complaint is made, the following information should be recorded:

- Employee name and title receiving the complaint.
- Personal information of the complainant, such as name, address, and telephone number.
- Date and time the complaint was made.
- Nature and description of the complaint.
- Corrective action taken to resolve the issue.
- Follow up with complainant in the form of a formal response.

Formal complaints should initiate an inspection of the suspected cause of the complaint. Corrective action should be implemented to mitigate the cause of the complaint wherever possible.

7.0 CONCLUSIONS

From an air quality perspective, the main concerns relating to construction activities typically include fugitive dust and diesel exhaust emissions, worst case meteorically conditions will include dry and/or windy days. Meteorological data from Billy Bishop Toronto City Airport is provided in . The project study area was reviewed and identified potential air-sensitive receptors were identified in Section 3.2 and Figure 3 and

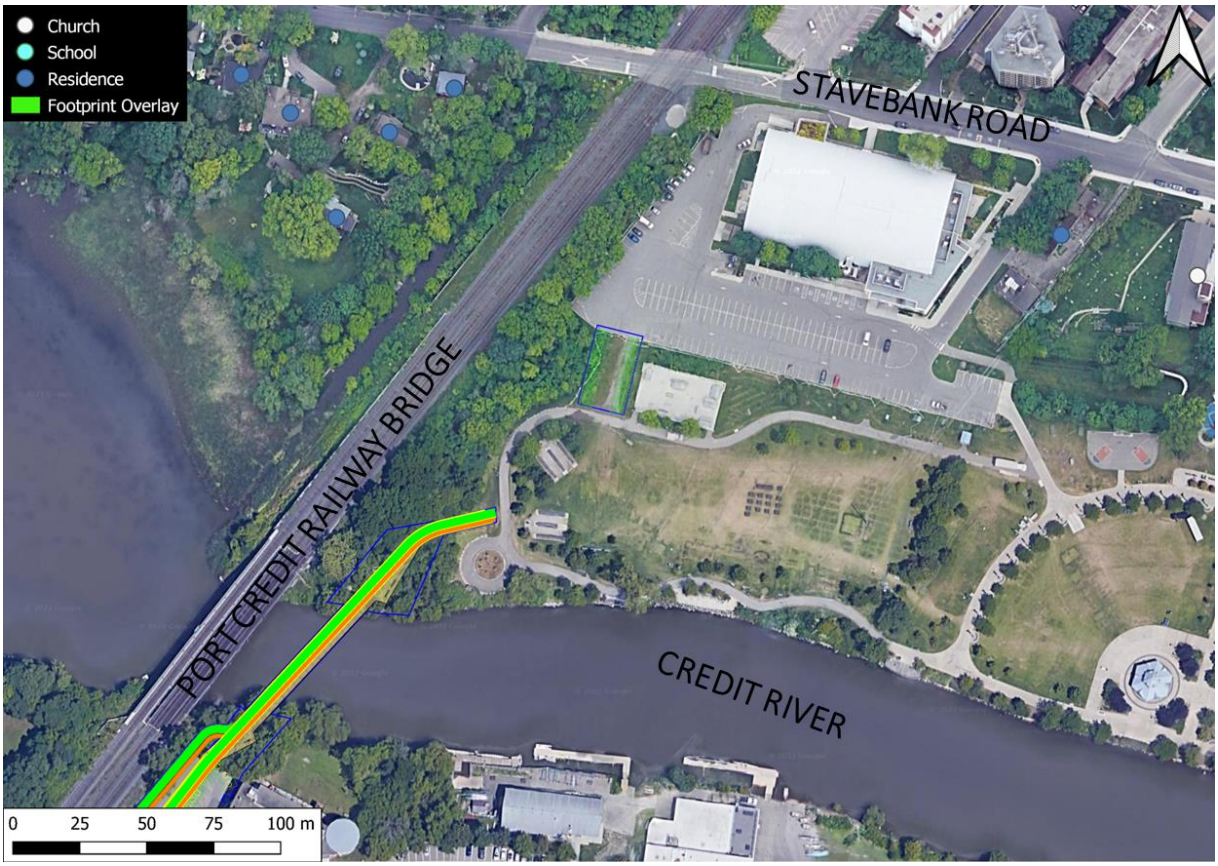

Figure 4. The project study area was reviewed and identified potential air-sensitive receptors were identified in Section 3.2 and Figure 3 and

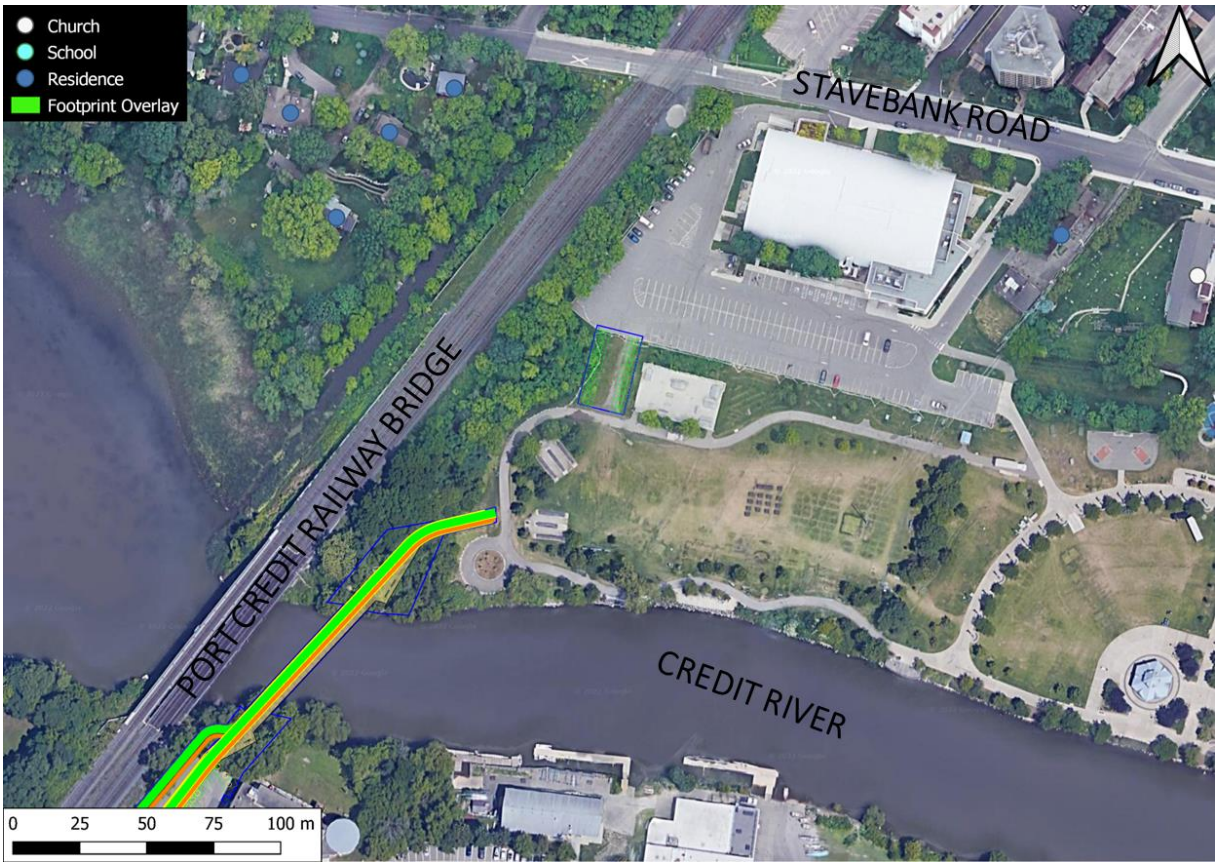

Figure 4. Considerations should be given to locating construction staging and storage areas away from identified receptors for both the south and north sides of the Credit River. Examples of common BMPs and controls have also been provided.