

# 9 Environmental Management Plans

## 9.1 Approach to Environmental Management

This section of the Environmental and Socio-economic review (ESR) report describes Environmental Management Plans (EMPs) that will be developed for construction and operation of the Surrey Newton-Guildford Light Rail Transit (LRT) (the Project).

The ESR was undertaken by TransLink to identify potential Project-related effects on environmental and socio-economic Review Elements and to select mitigation measures to avoid or limit those potential effects. The ESR was developed, in part, with input from participating First Nations, public, and stakeholders. Mitigation measures for construction and operations were identified for the Review Elements and form the basis for environmental management during Project construction and operations.

There are two main EMPs for the Project, the construction EMP (CEMP), and the operations EMP (OEMP), each to be developed in accordance with Project requirements. The CEMP is a Project-specific document that will be developed by the Construction Contractor prior to the commencement of construction. The OEMP will be based primarily on existing policies, practices, and procedures already in place for TransLink SkyTrain lines and implemented by the Project's Operator. The CEMP and the OEMP will each contain component management plans that will specify measures for managing the Project's environmental effects (e.g., noise, vibration, traffic).

This section includes a preliminary list of environmental-related licences, permits, and approvals anticipated to be required for construction (Section 9.2) and environmental responsibilities of TransLink (the owner), the Project's Construction Contractor and Operator (Section 9.3).

A description of the CEMP and each component management plan required for construction phase are outlined in Section 9.4. Where the CEMP provides general guidance for environmental management of an activity, the Construction Contractor will also be required to develop site-specific Environmental Work Plans (EWPs) for activities at certain sites where there is a risk of environmental effects and a need for more detailed planning to mitigate risk. The contents of EWPs are outlined in Section 9.5. Recommended content of the OEMP is outlined in Section 9.6. The Construction Contractor and the Operator will develop additional content for both plans which will require approval by TransLink, prior to implementation of the EMP.

The EMPs are to be developed based on information presented in the ESR and in accordance with relevant federal, provincial, and municipal legislation, regulations, and guidelines. They will guide environmental management of the Project, by providing construction and operation managers and on-site personnel with site-specific requirements, responsibilities, and mitigation measures.

## 9.2 Applicable Licenses, Permits, and Approvals

A preliminary list of environmental-related licences, permits, and approvals, anticipated for Project construction activities is identified in Table 9-1.

**Table 9-1: Applicable Environmental Licences, Permits, and Approvals**

| Legislation                                  | Permit or Approval  | Regulatory Agency   | Description/ Activity   | Relevant Review Element         | Notes  |
|--|---|---|---|---------------------------------|--|
| <i>Fisheries Act – (section 35)</i>          | Request for Project Review                                | Fisheries and Oceans Canada (DFO)   | Replacement of Bear Creek bridge with a clear span bridge and installation of a new sanitary sewer  | Fisheries and Aquatic Resources | City of Surrey received confirmation on January 23, 2018 that with the implementation of proposed mitigation measures, proposed activities would not result in serious harm to fish, no further permitting required. <sup>1</sup><br>Construction Contractor will be required to make Request for Review to DFO based on the final design where surface watercourses are affected. |
| <i>Environmental Management Act</i>          | Authorization from the FLNRORD                            | BC Forest Lands and Natural Resource Operations & Rural Development (FLNRORD) for discharges to the receiving environment | If excavation dewatering and discharge to sewer or receiving environment is required                | Fisheries and Aquatic Resources | Approval to be obtained by the Construction Contractor   |
| <i>Water Sustainability Act (WSA)</i>        | Changes In and About a Stream Change Approval Application | FLNRORD office  | Replacement of Bear Creek bridge with a clear span bridge and installation of a new sanitary sewer. | Fisheries and Aquatic Resources | Application submitted by City of Surrey on September 20, 2017 and is under review.<br>Construction Contractor will be required to make application for WSA Approvals based on the final design where surface watercourses are affected.  |
| <i>Water Sustainability Act</i>              | Changes In and About a Stream Notification                | FLNRORD office  | Relocation of watermain on 104 Avenue   | Fisheries and Aquatic Resources | Approval to proceed received on December 14, 2017.<br>Construction Contractor will be required to make application for WSA Approvals based on the final design where surface watercourses are affected.  |
| Erosion and Sediment Control Bylaw No. 16138 | Erosion and sediment control approval                     | City of Surrey  | Construction of the Project may result in sedimentation and erosion control issues                  | Fisheries and Aquatic Resources | Approval to be obtained by the Construction Contractor   |

| Legislation                         | Permit or Approval  | Regulatory Agency  | Description/ Activity  | Relevant Review Element            | Notes   |
|-------------------------------------|---|--|--|------------------------------------|---|
| Sewer Use Bylaw No. 299, 2007       | Waste Discharge Permit from the City of Surrey              | City of Surrey for discharges to stormwater system           | If excavation dewatering and discharge to sewer or receiving environment is required | Fisheries and Aquatic Resources    | Approval to be obtained by the Construction Contractor  |
| <i>Environmental Management Act</i> | Waste Discharge Permit                                      | Ministry of Environment and Climate Change Strategy (MOECCS) | If excavation dewatering and discharge to sewer or receiving environment is required | Fisheries and Aquatic Resources    | Approval to be obtained by the Construction Contractor  |
| <i>BC Wildlife Act</i>              | General Wildlife Permit                                     | FLNRORD  | Wildlife salvage and relocation  | Vegetation and Wildlife Resources  | Permit will be required if wildlife (e.g., amphibians) are discovered in the construction area and require salvage and relocation                                   |
| <i>Heritage Conservation Act</i>    | Heritage Inspection Permit<br>Heritage Investigation Permit | FLNRORD<br>Archaeology Branch                                | Potential for heritage and archaeology sites along the proposed alignment            | Archaeology and Heritage Resources | Should these permits be required, a qualified, professional archaeologist who is in good standing with the Archaeology Branch will prepare and submit applications. |

NOTE:

<sup>1</sup> The Request for Project Review under the *Fisheries Act* is being undertaken by the City of Surrey.

## 9.3 Project Environmental Responsibilities

This section describes TransLink's, the Construction Contractor's, and the Operator's environmental responsibilities during construction and operations.

It is anticipated that TransLink will be responsible for overseeing the Construction contractor and other parties responsible for construction activities to ensure compliance with the CEMP, and other environmental responsibilities identified in the Project Agreement.

### 9.3.1 Construction Contractor Responsibilities

It is anticipated that the Construction Contractor will be responsible for:

- obtaining and complying with applicable licenses, permits, approvals, and environmental best management practices (BMPs).
- developing and implementing a CEMP in accordance with requirements outlined in the Project's Table of Project Environmental Requirements (TPER) and other Project requirements.
- demonstrating compliance with the CEMP by undertaking environmental monitoring and reporting during construction in accordance with the CEMP, the Project requirements, and relevant regulatory licenses, permits, and approvals.
- maintaining and updating the CEMP to reflect changes to construction plans or activities that cannot be addressed at the EWP level, such as, changes in legislation, regulations, and conditions associated with licences, permits, and approvals.
- preparing and implementing EWPs in accordance with the CEMP.

### 9.3.2 Operator Responsibilities

It is anticipated that the Operator will be responsible for:

- developing and implementing an OEMP in accordance with requirements outlined in the Project's TPER and other Project requirements.
- demonstrating compliance with the OEMP by undertaking environmental monitoring and reporting during operation in accordance with the CEMP, the Project requirements, and relevant regulatory licenses, permits, and approvals.
- maintaining and updating the OEMP to reflect changes to operation plans or activities as well as any changes in legislation, regulations, and conditions associated with licences, permits, and approvals.

The OEMP is anticipated to be based on policies and procedures already in place for TransLink's existing SkyTrain lines and will be in place in advance of the Project becoming operational. Requirements for compliance and effectiveness monitoring will be described in EMPs, where applicable.

### 9.3.3 Environmental Practitioners

The Construction Contractor and the Operator will provide qualified environmental practitioners (QEPs) to oversee, manage, and implement the CEMP and the OEMP. QEPs are qualified and experienced environmental practitioners with an appropriate level of training and experience in their respective field, and in some cases, may hold professional designations (e.g., professional geoscientist, engineer, agrologist, or biologist). Recommended environmental practitioners for the Project are an Environmental Director, Environmental Manager, Environmental Monitor, and Environmental specialists. Responsibilities associated with these roles are summarized in Table 9-2.

**Table 9-2: Roles and Responsibilities**

| Role                      | Responsibility  |
|---------------------------|---|
| Environmental Director    | <ul style="list-style-type: none"> <li>Representing the Construction Contractor, the Environmental Director will, irrespective of such person’s other responsibilities, have defined authority for ensuring the establishment and maintenance of the Environmental Management Plans and auditing and reporting on the performance of the Environmental Management Plans, the Table of Project Environmental Requirements, and any terms and conditions associated with environmental Permits</li> <li>Communicates with TransLink and applicable regulatory agencies regarding compliance</li> </ul>  |
| Environmental Manager     | <ul style="list-style-type: none"> <li>Understand regulatory requirements, mitigation measures, and the other Project commitments described in the EMP</li> <li>Manage all environmental issues associated with the Project on a day-to-day basis, including overseeing the environmental monitoring program</li> <li>Effectively implements the Construction Environmental Management Plan (CEMP) and Environmental Work Plans (EWPs) on a day-to-day basis</li> <li>Reports weekly to TransLink on compliance as per Project requirements</li> <li>Authorizes Stop Work orders to Project personnel for non-compliance with the CEMP</li> </ul> |
| Environmental Monitor     | <ul style="list-style-type: none"> <li>Understands regulatory requirements, mitigation measures, and the other Project commitments described in the CEMP</li> <li>Monitors compliance to Project environmental requirements including those identified in the CEMP and EWPs</li> <li>Reports daily to Environmental Manager, including on observed and potential non-compliance</li> <li>Liaises with Project personnel and provides corrective action to the Construction Contractor field crews where necessary</li> </ul>  |
| Environmental Specialists | <ul style="list-style-type: none"> <li>Provide QEPs for specialized advice on discipline-specific environmental issues (e.g., air quality scientist, remediation specialist, wildlife biologist).</li> </ul>  |

## 9.4 Construction Environmental Management Plan

Previous sections of this ESR describe the potential for Project-related construction activities to affect environmental and socio-economical elements. The CEMP is to provide a framework for environmental management during construction by describing legislative requirements, key performance metrics for compliance, mitigation measures, and monitoring and reporting requirements to avoid or limit Project-related effects of construction. The CEMP will include a suite of component management plans to outline guidance for specific aspects of environmental management.

This section provides a summary of the following component plans:

- Air Quality and Greenhouse Gas Management Plan
- Archaeological and Heritage Resources Monitoring Plan
- Business Liaison Plan
- Communications Plan
- Construction Schedule
- Construction and Demolition Waste Management Plan
- Contaminated Sites and Materials Management Plan
- Environmental Awareness and Education Plan
- Fisheries and Aquatics Management Plan
- Hazardous Materials Management Plan
- Hazardous Building and Demolition Materials Management Plan
- Noise and Vibration Management Plan
- Sediment and Erosion Control and Water Quality Management Plan
- Spill Prevention, Fuel Management and Emergency Response Plan
- Traffic Management Plan
- Vegetation Management and Site Restoration Plan
- Wildlife Management Plan

Proposed mitigation measures applicable to component plans are listed in each component plan section. A full list of mitigation identified in the ESR and that will be included in the CEMP are provided in Section 10 of the ESR. Where applicable, component management plans should include contingency measures designed to provide Project personnel with instructions for handling unforeseen circumstances. Guidance provided in component management plans will be used by the Construction Contractor to develop detailed site-specific Environmental Work Plans (EWP)s (Section 9.5).

Each component plan should include the following:

- Purpose, scope, and objectives
- Roles and responsibilities
- Project, site orientation, and training requirements
- Summary of applicable mitigation measures
- Relevant regulatory requirements
- Monitoring and reporting requirements
- General and emergency contacts.

The CEMP and its component plans will apply to all persons involved with the Project during the construction phase, including workers and subcontractors.

#### **9.4.1 Air Quality and Greenhouse Gas Management Plan**

The objectives of the Air Quality and Greenhouse Gas Management Plan are to:

- avoid or limit effects from Project-related common air contaminants (e.g., sulphur dioxide [SO<sub>2</sub>], inhalable particulate matter [PM<sub>10</sub>]) and greenhouse gas emissions (e.g., carbon dioxide [CO<sub>2</sub>], methane [CH<sub>4</sub>])
- outline relevant regulatory and/or permit requirements
- describe key performance indicators, BMPs, mitigation measures, and monitoring requirements that will be implemented to limit potential Project-related effects on air quality during construction.

#### **9.4.2 Archaeological and Heritage Resources Monitoring Plan**

The objectives of the Archaeological and Heritage Resources Monitoring Plan are to:

- Limit potential Project-related effects on archaeological and heritage resources by providing Project personnel with a framework for identifying archaeological sites and artifacts as well as indicators of non-archaeological heritage resources.
- Provide a Chance Find Procedure that describes the types of archaeological and heritage sites that occur in the Lower Mainland, steps to follow if a suspected archaeological or heritage site is located during construction, and a plan for communicating with participating First Nations in the event an archaeological or heritage site is identified.

#### **9.4.3 Business Liaison Plan**

The objective of the Business Liaison Plan is to provide support for businesses throughout project construction by:

- maintaining access, curb-side visibility (to the extent possible), and parking for businesses and business operations (e.g., deliveries)
- facilitating ongoing communication with the Contractor, local businesses, and other interested stakeholders to address potential effects resulting from construction activities
- identifying the need for signage, notices, and notifications
- tracking and resolving issues, complaints, non-compliances, and other requests
- providing contact information, including a 24-hour contact number.

#### **9.4.4 Communications Plan**

The objectives of the Communications Plan are to:

- provide Project personnel with procedures to enable proper and efficient communication during construction of the Project
- describe general and emergency contact information, description of roles of key contacts, and plans for First Nations, community, and public relations.

#### **9.4.5 Construction Schedule**

The Construction Schedule will be distributed such that all Project personnel are provided with clear timelines for obtaining environmental permits, environmental protection activities, applicable least risk timing windows, and any other restrictions relating to environmental protection.

#### **9.4.6 Construction and Demolition Waste Management Plan**

The objectives of the Construction and Demolition Waste Management Plan are to:

- manage construction-related waste and protect soil and water quality, wildlife, aquatic environments, and the public from negative effects of Project-related waste
- describe procedures and BMPs for the proper storage and disposal of construction materials, measures to manage food waste that may attract wildlife, and identify opportunities for reuse of non-hazardous construction materials. The Construction Waste Management Plan should follow the *Environmental Management Act*.

#### **9.4.7 Contaminated Sites and Materials Management Plan**

The objectives of the Contaminated Sites and Materials Management Plan are to:

- manage contaminated sites in compliance with the Contaminated Sites Regulation of the *Environmental Management Act*
- identify locations of known and potential contaminated sites, remediation procedures for working in and near known and potential contaminated sites
- describe contingency procedures to follow if a contaminated site is encountered or an accidental release occurs during construction, as well as testing and reporting requirements.
- provide the appropriate Project personnel with procedures to follow for the proper management of fill materials used in construction of the Project
- describe the identification, classification, management of fill material used for construction of the Project, and procedures for inspecting, tracking, storage, and reuse of imported or transferred fill materials on site
- describe a reporting plan for documenting the origin and quality of materials brought to the site.

#### **9.4.8 Environmental Awareness and Education Plan**

The objectives of the Environmental Awareness and Education Plan are to:

- provide Project personnel with training opportunities to enhance environmental awareness related to the Project
- outline training workshops, public programs, and outreach activities, their objectives, and targeted audiences
- a timeline that outlines when training should be offered
- provide an outline of training materials and content to be covered in each workshop.

#### **9.4.9 Fisheries and Aquatics Management Plan**

The objectives of the Fisheries and Aquatics Management Plan are to:

- demonstrate compliance to regulatory requirements and permit conditions regarding the protection of fish and fish habitat
- limit damage to fish and aquatic habitats during construction and outline mitigation and enhancement for aquatic habitats that will be affected by the Project
- describe locations and a description of fish habitat, reduced risk timing windows, fish salvage methods, and linkages to other EMPs that include mitigations to manage potential deleterious materials.

#### **9.4.10 Hazardous Materials Management Plan**

The objectives of the Hazardous Materials Management Plan are to:

- limit the risk of a spill or safety incident involving dangerous goods, fuels and materials during construction of the Project
- demonstrate compliance with the *Workers Compensation Act*, *Transportation of Dangerous Goods Act* and Regulations, *Environmental Management Act*, Hazardous Waste Regulation, Workplace Hazardous Materials Information System, Occupational Health and Safety Regulations, and associated Safe Work Practices
- identify procedures for the transport of dangerous goods and materials, storage and handling of fuels, lubricants and hydraulic fluids, training requirements for Project personnel and contractors, measures for proper inventory and storage of dangerous goods and materials in environmentally sensitive areas, and servicing and inspection requirements for transport and storage equipment
- provide procedures for environmental incident reporting.

#### 9.4.11 Hazardous Building and Demolition Materials Management Plan

The objectives of the Hazardous Building and Demolition Materials Management Plan are to:

- provide Project personnel with a plan should hazardous building materials be encountered during demolition activities
- demonstrate compliance with the *Workers Compensation Act*, Occupational Health and Safety Regulations, and associated Safe Work Practices
- describe performance objectives, procedures and BMPs for the identification, abatement, verification, transportation, and disposal of hazardous building materials encountered during the demolition of structures required for the Project.

#### 9.4.12 Noise and Vibration Management Plan

The objectives of the Noise and Vibration Management Plan are to:

- limit effects on the local community and sensitive receptors from Project-related noise and vibration levels that exceed identified thresholds during construction, such as site preparation and right-of-way construction
- describe applicable noise (i.e., Surrey Noise Bylaw and Health Canada Guidance) and vibration targets and thresholds (i.e., that may result in damage to buildings or human and sensitive equipment receptors) described in the ESR
- describe the schedule of construction activities and hours, , equipment inspection and maintenance requirements, public outreach program, noise monitoring , vibration monitoring and variance application process
- describe pre- and post-construction monitoring requirements.

#### 9.4.13 Sediment and Erosion Control and Water Quality Management Plan

The objectives of the Sediment and Erosion Control and Water Quality Management Plan are to:

- manage sedimentation and erosion to avoid or limit effects on fish and aquatic environments and stormwater quality
- describe performance objectives and sampling requirements for metals, hydrocarbons, volatile organic compounds, turbidity, suspended sediment, pH, dissolved oxygen, conductivity and water temperature, and other water quality parameters to be monitored during construction
- describe BMPs and mitigation measures to be implemented to manage erosion, slope movement, runoff, and sedimentation
- describe measures to manage rainwater and runoff and prevent contaminants and sediment-laden water from entering storm drains
- monitor water quality for compliance with the *Fisheries Act*, the Federal water quality guidelines for the protection of aquatic life, *Water Sustainability Act*, the City of Surrey's Sewer Use Bylaw No. 299, 2007.

#### **9.4.14 Spill Prevention, Fuel Management and Emergency Response Plan**

The objectives of the Spill Prevention, Fuel Management and Emergency Response Plan are to:

- limit the potential for an accident or malfunction caused by Project-related activities and to equip Project personnel with procedures to follow in the event of an accident, malfunction, or natural hazard
- outline a list of materials and equipment that will be stored on site (e.g., spill abatement materials, clean-up kits, survival kits)
- describe roles and responsibilities and training requirements for on-site personnel, spill response procedures, and reporting requirements.

#### **9.4.15 Traffic Management Plan**

The objectives of the Traffic Management Plan are to:

- address temporary Project-related effects on local traffic and transportation construction by maintaining safe and efficient goods and traffic movement, well-connected street networks, and access to residential and non-residential properties, community amenities, and emergency services
- demonstrate adherence to the Ministry of Transportation and Infrastructure's *1999 Traffic Control Manual for Work on Roadways* (MOTI 1999)
- demonstrate that all road users (e.g., drivers, cyclists, and pedestrians, including those with disabilities) are considered
- manage Project-related changes to traffic and access by including the following four sub plans: Traffic Control Plan, Incident Management Plan, Public Information Plan, and the Implementation Plan.

#### **9.4.16 Vegetation Management and Site Restoration Plan**

The objectives of the Vegetation Management and Site Restoration Plan are to:

- avoid or limit Project-related effects on vegetation (e.g., boulevard trees, plant species at risk) particularly during site preparation and prevent the spread and establishment of invasive or noxious plants
- describe measures for preventing the spread of invasive and noxious plants, steps for Project personnel to follow if invasive or noxious plants are discovered during construction, measures for reducing disturbance in sensitive areas (e.g., riparian areas near Bear Creek Park), and reporting and re-planting requirements for boulevard trees
- restore and revegetate areas of the Project site that are disturbed due to the Project and not addressed in the Landscape Plan.

#### 9.4.17 Wildlife Management Plan

The objectives of the Wildlife Management Plan are to:

- limit or avoid Project-related effects on wildlife and wildlife habitat during construction of the Project
- describe measures to limit effects on known wildlife habitat features and sensitive habitats, manage discoveries of invasive wildlife or species at risk (species on the provincial Red- or Blue-list or on Schedule 1 of the *Species at Risk Act*), limit risk of injury or mortality of wildlife
- identify sensitive timing windows for wildlife and describe permitting requirements for wildlife salvage and relocation.

### 9.5 Environmental Work Plans

The Construction Contractor will prepare site-specific EWPs that are consistent with the CEMP to identify construction activities that will interact with environmental elements, environmentally sensitive areas, and mitigation measures to be implemented by the Construction Contractor to protect against environmental damage. The EWPs should be submitted to the Owner's Representative prior to the commencement of construction activities at specific sites and will be adopted by the Construction Contractor, any subcontractor, or any other person involved in Project construction activities at the applicable site.

At a minimum, each EWP should:

- describe the site location applicable to the EWP, the work schedule, and key environmental contacts related to the specific work described in the EWP
- describe the activities to be undertaken and equipment required to complete the work;
- include a list of applicable permits and authorizations
- describe training requirements for personnel working on the site
- identify environmental sensitive areas at the site and in adjacent areas shall be described in writing and identified on maps or drawings, as appropriate
- describe mitigation measures to be implemented at environmentally sensitive areas and any maintenance requirements
- reference applicable sections, terms, conditions, and commitments of the CEMP
- describe the expected and scheduled timing of environmental inspections, including full-time, daily, and as required inspections, as applicable, and the specific reporting procedures that will apply
- include relevant emergency procedures and emergency contact information
- include contact information the Construction Contractor and for any personnel applicable to the specific construction works described for the site.

## 9.6 Operations Environmental Management Plan

The OEMP will be developed and implemented by the Operator. It will describe measures to avoid or limit potential adverse environmental and socio-economic effects during Project operation and maintenance.

Component plans, which may be amended as necessary, may include:

- Roles and responsibilities
- Monitoring and reporting requirements
- Access management plan
- Air quality and dust control management
- Fuel, chemicals, and material storage and handling
- Environmental aspects of health and safety
- Incident management plan
- LRT operation management plan
- Noise and vibration management
- Solid and liquid waste management
- Snow management plan
- Water and sediment quality management plan
- Storm water management
- Spill and emergency response
- Transit priority and integration plan.

The OEMP will be updated by the Operator in consideration of existing policies, practices, and procedures during the operational phase of the Project.

## 9.7 References

MOTI (Ministry of Transportation and Infrastructure). 1999. 1999 Traffic Control Manual for Work on Roadways. Available at:  
<https://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/traffic-engineering-safety/trafficmanagementmanual/traffic-control-1999> . Accessed: March 2018.