

# Environmental Construction Operations (ECO) Plan Framework

2017 EDITION

In partnership with





## **PUBLISHING INFORMATION**

**TITLE:** Environmental Construction Operations (ECO) Plan Framework  
*Instructions for Preparing ECO Plans for Alberta Transportation, City of Calgary and City of Edmonton Construction Projects*

**PREPARED BY:** Alberta Transportation  
The City of Calgary  
The City of Edmonton

**DOCUMENT HOLDER:** The City of Calgary, Environmental & Safety Management, under the terms of the ECO Plan Framework Memorandum of Understanding (*EXT 03 – ECO MOU*).

**EDITION:** 2017 edition. This document replaces the 2016 edition released 30 January 2016.

**RELEASE DATE:** 30 January 2017

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## Environmental Construction Operations (ECO) Plan Checklist

Project Name: \_\_\_\_\_

Contractor's On-Site Representative(s) (Name & Company): \_\_\_\_\_

ECO Plan submitted to (Name & Jurisdiction): \_\_\_\_\_

Note: All checklist items are required in the ECO Plan. Explain any deficiencies in the comments section on page b.  
 Ensure that this three-page checklist is signed and submitted with the ECO Plan.

ECO Plan Framework Step	Content Requirements	YES	NO	N/A
<b>STEP 1: Project Description</b>				
1.1 Project Overview	Briefly describe the construction project and its location.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Site Activities	Detail the scope of work. List all construction and demolition activities and specify the main equipment that will be used during those activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Project Schedule	Provide a project schedule that includes scheduled shut-downs and restricted work periods due to environmental requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>STEP 2: Project Setting &amp; Site Drawing(s)</b>				
2.1 Site Characteristics	Describe the existing condition of the project site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Environmental Sensitivities	Describe site-specific sensitive features that could be impacted by the Contractor's activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Site Drawing(s)	Provide site drawing(s) that detail the site location, set-up and layout; erosion and sediment controls; and, environmental sensitivities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>STEP 3: Potential Environmental Impacts &amp; Controls</b>				
3.1 Permits, Approvals, Authorizations & Notifications	Append copies of all project permits, approvals, authorizations and notifications (and their associated applications, when referenced in the approval) to the ECO Plan, and list their file names, numbers and environmental conditions and/or restrictions in a table like Table 3-1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Regulatory Compliance	Describe specific regulatory requirements (additional to those listed in Step 3.1) as well as corporate policy and/or program requirements that directly impact or restrict the construction project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Potential Environmental Impacts & Mitigation Strategies	Identify all potential project-specific environmental issues and impacts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Describe procedures, controls or best management practices (BMPs) that will be used to prevent or reduce adverse environmental impacts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 Erosion & Sediment Control	Provide project-specific, jurisdiction-appropriate erosion and sediment controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.5 Municipal Tree Protection	Provide project-specific, jurisdiction-appropriate municipal tree protection measures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ECO Plan Framework Step	Content Requirements	YES	NO	N/A
<b>STEP 4: Hazardous Materials &amp; Waste Management</b>				
4.1 Hazardous Materials	List every hazardous material to be used or stored on site by the Contractor and all sub-contractors, and provide appropriate handling, containment, storage and disposal methods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Waste Management	List all anticipated hazardous and non-hazardous waste materials along with proper handling and disposal methods. Provide all additional jurisdiction-specific handling procedures.	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
<b>STEP 5: ECO Plan Implementation</b>				
5.1 On-Site Representative	Provide name(s) and contact details for the Contractor's On-Site Representative(s).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Training & Communication	Detail the procedures that will be used to train staff and sub-contractors in their ECO Plan responsibilities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3 Monitoring & Reporting	Describe monitoring and inspection procedures that suit the nature and scale of the project and meet regulatory and contractual requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4 Documentation	Describe the environmental information and ECO Plan records that will be kept in up-to-date hard copies on the project site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5 ECO Plan Update	Provide ECO Plan review and update procedures.  Append a current ECO Plan Revision Summary table (e.g., Table 5-3) to all updated ECO Plans.	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
<b>STEP 6: Environmental Emergency Procedures</b>				
6.1 Environmental Emergency Prevention & Response	Identify potential incidents that may impact the environment, and provide appropriate prevention and response procedures. In addition, provide an environmental emergency response contact list.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comments (include relevant special provisions and/or conditions for the project, and explain any deficiencies in the ECO Plan):**

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**Contractor Responsibilities**

**All Contractors need to be aware of their responsibilities for protecting the environment. The Contractor is responsible, either by its own actions or through its sub-contractors, for providing the resources needed to develop and implement the ECO Plan. The Contractor is responsible for ensuring sub-contractors understand their roles and responsibilities, and operate in compliance with the ECO Plan.**

**Contractors must refer to the terms and conditions contained in applicable contractual and regulatory documents to be fully aware of their responsibilities. In general, Contractors must:**

a)	Identify the potential environmental issues and develop environmental mitigation measures to prevent or minimize environmental impacts.
b)	Identify and acknowledge permits, approvals, authorizations, notifications, guidelines, standards, policies and programs applicable to the project.
c)	Prepare and update the ECO Plan in accordance with this ECO Plan Framework.
d)	Submit copies of the ECO Plan and all other required documentation to the consultant for Alberta Transportation projects or The City Project Manager for municipal projects.
e)	Revise the ECO Plan as required based on reviewer (i.e., The City of Calgary, The City of Edmonton or the consultant for Alberta Transportation projects) comments.
f)	Identify an on-site individual to be the Contractor's On-Site Representative to maintain environmental controls and address any environmental issues or questions that arise. The Contractor must identify this individual within the ECO Plan (see page a of the ECO Plan Checklist and Step 5.1) and at the pre-construction meeting.
g)	Train staff and sub-contractors so they can identify, address and report potential environmental problems.
h)	Review the ECO Plan requirements at orientation meetings, the pre-construction meeting, tailgate meetings, etc.
i)	Implement and maintain environmental mitigation measures in accordance with the ECO Plan.
j)	Correct and record any deficiencies in a timely and appropriate manner.
k)	Take corrective action (e.g., shut down work) when it is recognized that an impact to the environment may occur or has occurred.
l)	Ensure that all sub-contractors comply with the ECO Plan.
m)	Sufficiently monitor the work site to ensure that the ECO Plan is effective for all conditions, including inclement weather and shut-down periods. Document all monitoring efforts.

*This ECO Plan is complete to the best of our abilities. The undersigned acknowledges and accepts the responsibilities detailed herein.*

\_\_\_\_\_  
Contractor Principal-in-Charge Signature

\_\_\_\_\_  
Name (please print)

\_\_\_\_\_  
Date



## Introduction

The Environmental Construction Operations (ECO) Plan Framework guides the development of ECO Plans for Alberta Transportation, The City of Calgary and The City of Edmonton. ECO Plans ensure the following:

- environmental considerations are integrated into project decision making
- the project is compliant with applicable regulations, bylaws and guidelines
- all parties demonstrate environmental commitment, both in writing and in action, to their stakeholders and the public

## ECO Plan Definition

An ECO Plan is a project-specific plan that identifies and mitigates the potential environmental impacts of construction. Contractors are responsible for developing and implementing ECO Plans for their projects. ECO Plans cover the following topics:

- project setting, activities and schedule
- applicable permits, approvals and regulations
- potential environmental impacts and controls
- hazardous materials and waste management
- ECO Plan implementation procedures
- environmental emergency response procedures

***DEFINITION: Environmental Construction Operations (ECO) Plan***  
*An ECO Plan is a Contractor's plan to identify and mitigate the environmental impacts that may result from their activities.*

## ECO Plan Process

It is the Contractor's responsibility to develop and implement an ECO Plan. ECO Plans may be required by Alberta Transportation, The City of Edmonton or The City of Calgary in the contract/tender documents.

Project-specific ECO Plans must follow this Framework, and adopt the headings and structure provided here. The ECO Plan checklist (pages a-c) must be completed and included with the ECO Plan; it should be used to ensure that the ECO Plan is complete. The ECO Plan Checklist must identify an On-Site Representative and be signed by the Contractor Principal-in-Charge.

***The ECO Plan must include a completed ECO Plan checklist. This checklist must identify an On-Site Representative and be signed by the Contractor Principal-in-Charge.***

Contractors must submit their ECO Plans to the appropriate jurisdiction at least 14 days prior to the scheduled start of construction. The reviewer will evaluate the ECO Plan, and one of the following will result:

1. **Acceptance** — If the ECO Plan is accepted to the mutual satisfaction of the Contractor and the reviewer (i.e., reviewers include The City of Calgary, The City of Edmonton or the consultant for Alberta Transportation projects), the Contractor will be advised in writing that the ECO Plan is complete.
2. **Follow-up or Revision** — If the reviewer identifies deficiencies or has questions, they will follow up with the Contractor. Incomplete ECO Plans will be returned to the Contractor for revision. ECO Plans must be completed to the mutual satisfaction of all parties. All changes to the ECO Plan must be documented (see Step 5.5; include a revision summary table such as Table 5-3) and copies of the updated ECO Plan forwarded to the reviewer and other parties, as applicable.

No work may begin until all parties have agreed to the ECO Plan.

***The Contractor must submit the ECO Plan to the appropriate jurisdiction at least fourteen (14) days prior to the scheduled start of construction.***

***No work may begin until all parties have agreed to the ECO Plan.***

## ECO Plan Instructions

This Framework provides instructions for developing ECO Plans for Alberta Transportation, The City of Edmonton and The City of Calgary. All ECO Plans must follow this Framework, and adopt the headings and structure provided here.

ECO Plans must present organized, summarized information. When a document is well organized, the information is easy to use. All parties must use and understand the ECO Plan to successfully identify and mitigate the potential environmental impacts of the project.

The following sections describe the six components of an ECO Plan.

***This document guides project-specific ECO Plan development. Boxes (like this one) are located at the start of each section, and contain specific summaries of what is required in that section.***

## ECO Plan Template

The goal of Alberta Transportation, The City of Edmonton and The City of Calgary is to have quality, organized ECO Plans that describe the project, its potential effects and its mitigation and control measures. These ECO Plans are easily reviewed, understood and implemented by all parties. Unfortunately, many poor quality or incomplete ECO Plans are submitted, placing substantial burdens on the review process.

To address this challenge, Alberta Transportation, The City of Edmonton and The City of Calgary are developing a new, standardized format for ECO Plans. They have produced a draft ECO Plan template; this draft is available for use on a trial basis in the 2017 calendar year ([ECO Plan Template](#); Internet Explorer required). The Province and Cities encourage all Contractors developing ECO Plans to try the template and submit feedback to [ECOPlan@calgary.ca](mailto:ECOPlan@calgary.ca).



## Step 1 Project Description

<b>STEP 1</b>	<b>1.1 Project Overview</b>	Briefly describe the construction project and its location.
	<b>1.2 Site Activities</b>	Detail the scope of work. List all construction and demolition activities and specify the main equipment that will be used during those activities.
	<b>1.3 Project Schedule</b>	Provide a construction project schedule that includes scheduled shut-downs and restricted work periods due to environmental requirements.

### 1.1 Project Overview

*Briefly describe the construction project and its location.*

In this section, briefly describe the nature and location of the construction project. The project description must include the following:

- type of project
- name and location of the project (including legal land description and municipal address, if applicable)
- site size
- details of the main components of the project, including any permanent and temporary structures

### 1.2 Site Activities

*Provide a detailed scope of work. List the construction and demolition activities that will occur during the project and specify the main equipment that will be used during those activities.*

In this section, provide the scope of work and list all construction and demolition activities (e.g., earthworks, surfacing, saw cutting, stream crossings) that will occur during the project. It is particularly important for the ECO Plan to describe specific on-site construction activities that could result in environmental impacts.

Construction projects use many different types of equipment. The Contractor will provide a project-specific list of the equipment that will be used during the construction and demolition activities. Some examples of equipment that could be included are as follows:

- General construction and demolition (e.g., personal hand tools, pumps, generators)
- Trucking and hauling (e.g., pickup trucks, delivery trucks, pump trucks)
- Earthmoving (e.g., excavators, graders, loaders, backhoes, bobcats, dump trucks)
- Lifting and material handling (e.g., mobile cranes, man lifts)
- Paving and compacting (e.g., asphalt pavers, drum compactors)
- Concrete handling (e.g., saw cutting equipment, concrete trucks)
- Drilling and trenching (e.g., directional drills, trenchers, hydrovac trucks)

### 1.3 Project Schedule

*Provide a construction project schedule that includes scheduled shut-downs and restricted work periods due to environmental requirements.*

The ECO Plan will include a project schedule that presents the sequence and timing of construction activities. It will identify any time-sensitive environmental considerations, including scheduled shut-downs and restricted work periods. For example, in-stream work may be restricted to the times outlined within federal and provincial regulatory approvals.



## Step 2 Project Setting & Site Drawing(s)

<b>STEP 2</b>	<b>2.1 Site Characteristics</b>	Describe the existing condition of the project site.
	<b>2.2 Environmental Sensitivities</b>	Describe the site-specific or protected features that could be impacted by the Contractor's activities.
	<b>2.3 Site Drawing(s)</b>	Provide site drawing(s) that illustrate the site location; site set-up and layout; jurisdiction-appropriate erosion and sediment controls; and, environmental sensitivities.

### 2.1 Site Characteristics

*Describe the existing condition of the project site.*

In this section, describe the project site's topography, drainage and storm water infrastructure. It is helpful to include site photographs in this section.

### 2.2 Environmental Sensitivities

*Describe site-specific sensitive or protected features that could be impacted by the Contractor's activities.*

The Contractor must pre-screen the project site for environmental sensitivities and concerns. To pre-screen the site, review the contract documents and all applicable environmental information and reports, such as the following:

- Biophysical Impact Assessment
- Environmental Evaluation
- Historical Resources Impact Assessment
- Phase I and/or II Environmental Site Assessment
- Risk Management Plan

In this section, describe the sensitive or protected features that could be impacted by the Contractor's activities. This description must include source references, be specific to the project site, and highlight features that require protection such as:

- wildlife and wildlife habitat (consider both terrestrial and aquatic animals)
- waterbodies (e.g., wetlands, streams, creeks)
- vegetation (e.g., trees, rare plants, noxious weeds)
- archaeological, paleontological and/or other historical resources
- parks, protected areas and other designated lands
- site contamination and/or underground infrastructure (e.g., monitoring wells, pipelines)

Show all environmental sensitivities and protected features on the site drawing(s) (see Step 2.3).

## 2.3 Site Drawing(s)

*Provide one or more site drawing(s).*

In this section, provide site drawing(s) of appropriate scale showing:

- project location
- site set-up and layout
- erosion and sediment controls (as appropriate for the jurisdiction; see Step 3.4 and Table 3-4 for more details)
- environmental sensitivities (see Steps 2.2, 3.1–3.3 and 3.5 for more details)

The site drawing should contain standard map features (e.g., north arrow, scale, legend) and be at an appropriate scale to show the location of the project components and activities relative to existing features. Table 2-1 summarizes some additional details that may be relevant to include on the site drawing(s).

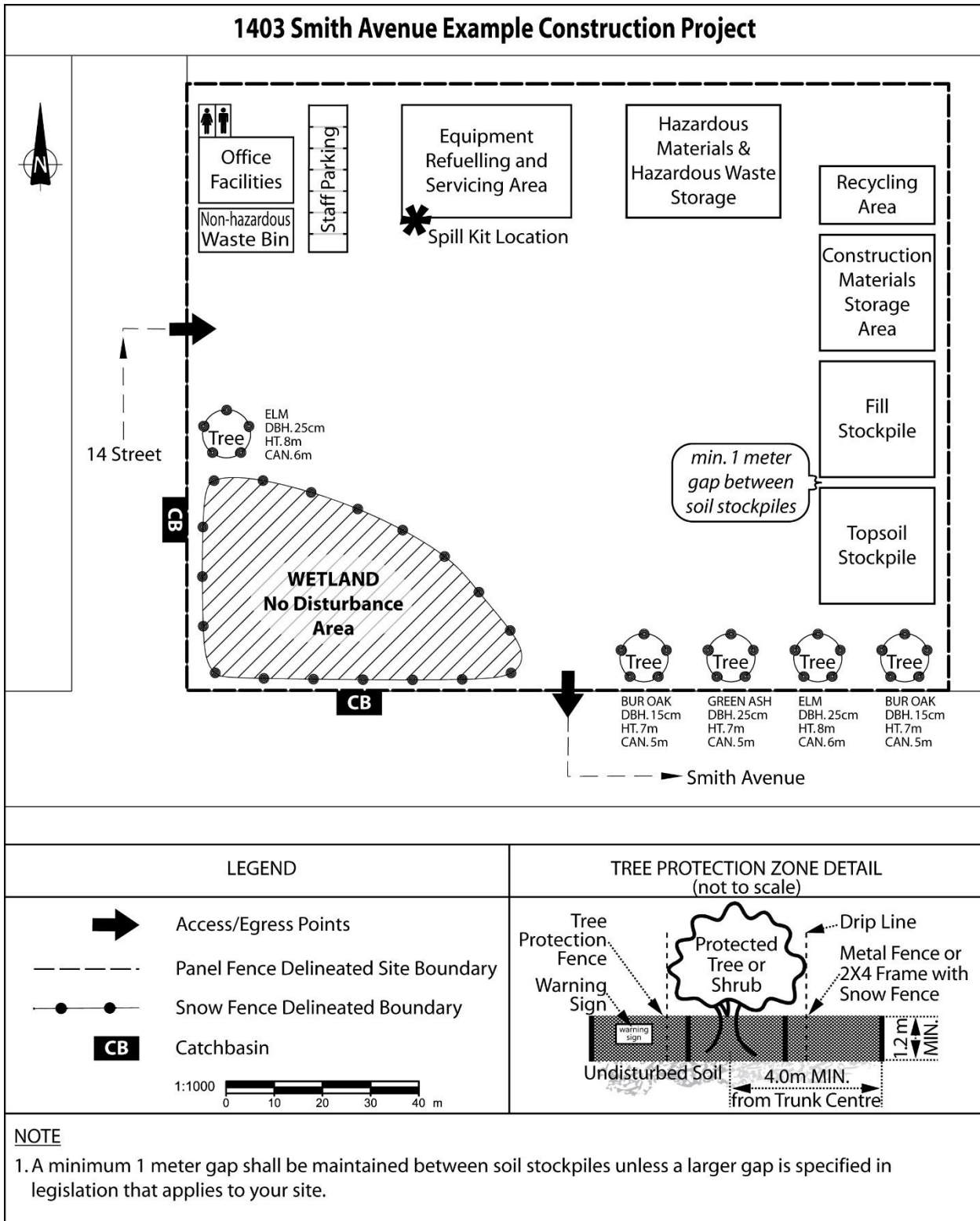
**Table 2-1 Example: Potential Details to include on the Site Drawing(s)**

Site Location	Site Set-up and Layout	Erosion and Sediment Controls	Environmental Sensitivities
<ul style="list-style-type: none"> <li>• Site location (e.g., municipal address; legal land description)</li> <li>• Site size</li> <li>• Project boundaries</li> <li>• Municipal boundaries, historic sites, protected areas (e.g., parks), federal land</li> <li>• Linear and other transportation components (e.g., railways, roads)</li> </ul>	<ul style="list-style-type: none"> <li>• Access/egress points</li> <li>• Traffic routes</li> <li>• Temporary parking</li> <li>• Office</li> <li>• Toilets</li> <li>• Staging areas</li> <li>• Borrow areas</li> <li>• Stockpile locations</li> <li>• Refuelling areas</li> <li>• Recycling areas</li> <li>• Spill kits</li> <li>• Hazardous materials storage</li> <li>• Hazardous and non-hazardous waste storage</li> </ul>	<ul style="list-style-type: none"> <li>• Project-specific erosion and sediment controls as appropriate for the jurisdiction (see Step 3.4 and Table 3-4 for more details)</li> <li>• Storm water infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Environmentally sensitive areas (e.g., wildlife and wildlife habitat; waterbodies such as wetlands, streams and creeks; vegetation such as trees and rare plants)</li> <li>• Buffers around sensitive areas</li> <li>• Trees to be protected (and the specific tree protection measures as appropriate for the jurisdiction; see Step 3.5 and Table 3-5 for more details)</li> <li>• Storm water discharge points</li> <li>• Monitoring wells</li> <li>• Contamination</li> </ul>

Annotated photographs can be included in this section. Super-imposing construction site set-up and operational details on aerial photographs of appropriate scale and nature is particularly informative.

See the sample site drawing on the following page.

## Sample Site Drawing



## Step 3 Potential Environmental Impacts & Controls

STEP 3	<b>3.1 Permits, Approvals, Authorizations &amp; Notifications</b>	<p>Compile the file name, number and environmental conditions and/or restrictions of all required project permits, approvals, authorizations and notifications.</p> <p>Append copies of all project permits, approvals, authorizations and notifications (and their applications, when referenced in the approval) to the ECO Plan.</p>
	<b>3.2 Regulatory Compliance</b>	<p>Describe regulatory, corporate policy and program requirements (additional to those listed in Step 3.1) that directly impact or restrict the construction project.</p>
	<b>3.3 Potential Environmental Impacts &amp; Mitigation Strategies</b>	<p>Describe the potential environmental issues and impacts that may result from the construction activities.</p> <p>Provide procedures, controls or best management practices (BMPs) to prevent or reduce adverse impacts on the environment.</p>
	<b>3.4 Erosion &amp; Sediment Control</b>	<p>Provide project-specific, jurisdiction-appropriate erosion and sediment controls.</p>
	<b>3.5 Municipal Tree Protection</b>	<p>Provide project-specific, jurisdiction-appropriate municipal tree protection measures.</p>

### 3.1 Permits, Approvals, Authorizations & Notifications

*In this section, list the file name and number of all required project permits, approvals, authorizations and notifications. Compile all of the environmental conditions and restrictions prescribed by regulatory agencies in those documents into a summary table.*

*Append copies of all project permits, approvals, authorizations and notifications (and the associated permit applications, when referenced in the approval) to the ECO Plan.*

Provide the file number and title of all required project permits, approvals, authorizations and notifications and compile the environmental conditions and/or restrictions prescribed in those documents into a summary table (e.g., Table 3-1). If the approval references the permit application, also include the environmental conditions and/or restrictions described in that application in the summary table.

Append copies of all project permits, approvals, authorizations and notifications (as well as the associated permit applications, when relevant) to the ECO Plan.

The tender package will include many of the approvals. These approvals, along with any additional approvals needed for the project, must be identified in this section of the ECO Plan.

The Contractor, their staff and all sub-contractors must understand the current environmental legislation that governs their project as well as the environmental conditions and/or restrictions prescribed in permit conditions, approvals, authorizations and notifications.

Retain copies of project permits, approvals, authorizations and notifications (as well as the permit applications, when relevant) on site during all activities. Regulators may make site visits and inspections prior to, during and following construction.

**Table 3-1 Example: Project Permits, Approvals, Authorizations & Notifications**

<b>Example Project Permit, Approval, Authorization or Notification File Number and Title</b>	<b>Construction Activity</b>	<b>Example Environmental Conditions and/or Mitigation Measure(s)</b> <i>(as detailed in the permit, approval, authorization or notification OR its application)</i>
<b>Fisheries &amp; Oceans Canada Authorization CA-10-1249 Watercourse Crossings and Replacements — Tributary to Elbow River — Calgary</b>	All	No in-stream work occurs May 1–July 15 and Sept 16–April 5
	Isolation and dewatering	Operate machinery on land in a manner that minimizes disturbance to the bed and banks of the watercourse Remove fish from the work area prior to dewatering and release alive immediately into a downstream staging area
	etc.	etc.
<b>Alberta Environment &amp; Parks Authorization 37/801 to Construct the Access Road Tie-in to the Canal Pathway with the WHS Right-of-Way</b>	All	Within the canal ROW, minimize disturbance; no equipment is allowed outside the prescribed work area.
		Surface disturbance within the Department's canal ROW is permitted only during dry and/or frozen ground conditions.
		etc.
<b>Notification under the Code of Practice for Watercourse Crossings (City of Calgary file number 2017WAXP712)</b>	Post-Construction	The crossing site will be inspected at least once a year, during the snow-free season.
		A qualified aquatic environment specialist will design and conduct all monitoring.
		etc.
<b>City of Calgary Drainage Permit HPZ0079</b>	Site dewatering	The Permit Holder will notify The City of Calgary and all other required agencies if the results of water quality tests exceed specified limits.
		etc.

### 3.2 Regulatory Compliance

*Describe specific regulatory requirements (additional to those covered in Step 3.1) as well as corporate policy and/or program requirements that directly impact or restrict the construction project.*

The Contractor, their staff and all sub-contractors must understand and comply with all applicable regulatory requirements. In this section, describe specific regulatory requirements (other than permits, approvals, authorizations and notifications) as well as corporate policy and/or program requirements that directly impact or restrict this particular construction project (e.g., Table 3-2).

**Table 3-2 Example: Project Regulatory Requirements (other than permits, approvals, authorizations and notifications)**

Legislation	Construction Activity	Environmental Conditions
<b>Migratory Birds Convention Act and its regulations</b>	All	Avoid engaging in potentially destructive or disruptive activities in key sensitive periods and locations, in order to reduce the risk of affecting migratory birds, their nests or eggs. Key sensitive periods include breeding and nesting (generally mid-March to late August in most parts of Canada), spring migration and fall migration. To determine the requirements for a specific project, consult with the Canadian Wildlife Service and provincial wildlife agencies.
		etc.
<b>Alberta Weed Control Act and its regulations</b>	All	A person shall control noxious weeds and destroy prohibited noxious weeds that are on land the person owns or occupies.
		Subject to the regulations, a person shall not use or move anything that, if used or moved, might spread a noxious weed or prohibited noxious weed.
<b>City of Calgary Community Standards Bylaw 5M2004</b>		A Person shall not engage in any activity that is likely to allow smoke, dust or other airborne matter ... to escape the Premises without taking reasonable precautions to ensure that the smoke, dust or other airborne matter does not escape the Premises.
		etc.
<b>City of Edmonton Corporate Tree Management Policy C456A</b>	All	Contractors are responsible for the regular watering and maintenance of City trees while enclosed by tree protection hoarding.
		All equipment, soil, building materials and other debris shall be kept outside of the tree protection hoarding.
		etc.

### 3.3 Potential Environmental Impacts & Mitigation Strategies

*In this section, describe the potential environmental issues and impacts that may result from the construction activities. Then summarize the procedures, controls and best management practices (BMPs) that this project will use to prevent or reduce adverse impacts on the environment.*

An environmental impact is any change to the environment (positive or negative) resulting from the construction activities. For the purposes of the ECO Plan, negative impacts are the primary concern.

The Contractor should focus on the environmental impacts over which they have reasonable control. These potential issues and impacts will form the basis of the project-specific ECO Plan.

The review process for potential issues and impacts should consider normal operating conditions; shut-down and start-up conditions; and, any reasonably foreseeable emergency or abnormal situations. Further, ensure the review considers:

- potential releases of emissions to air (e.g., dust)
- potential releases to land (e.g., spills), surface water and groundwater
- potential to harm habitat or regulated species
- noise and light issues
- site waste management

Taking into account the environmental sensitivities, construction activities and regulatory requirements discussed in the previous sections, as well as any new sensitivities described in this section, provide a comprehensive summary of all the procedures, controls or best management practices that will be used to prevent or reduce adverse impacts on the environment.

Mitigation measures must be developed based on the Contractor's own site information, with reference to the consultant's Risk Assessment (for Alberta Transportation projects), and any relevant conditions contained within permits, approvals, authorizations and/or notifications. Include mitigation measures contained in the contract, including Standard General Conditions or Standard Specifications as applicable. Table 3-3 provides one method of summarizing potential environmental impacts and mitigation measures.



**Table 3-3 Example: Potential Environmental Impacts and Mitigation Measures**

Construction Activity	Potential Environmental Impact(s)	Environmental Mitigation Measure(s)
<b>Earthworks</b>	Erosion and compaction of soils Transport of sediment and associated contaminants by water and wind Sedimentation in infrastructure and waterbodies Loss of vegetation Damage to trees	Minimize the area of exposed soil by phasing stripping and grading work and/or ensuring timely implementation of suitable temporary or permanent soil stabilization measures Implement, inspect and maintain erosion and sediment controls Ensure traffic travels along pre-defined routes and within the confines of the working easements Install fencing around the drip lines of trees to protect the trees from vehicles and equipment
<b>Refuelling and servicing of equipment</b>	Hydrocarbon spills	Ensure spill kits are on all vehicles and workers are trained in their use Designate refuelling areas appropriate distances from waterbodies
<b>Ground Disturbance</b>	Unexpected discovery of historic contamination	Ensure that workers are trained to recognize the signs of possible contamination (e.g., drums and containers; stained or discoloured earth in contrast with adjoining soil) and immediately report them to the appropriate regulatory authorities
<b>In-stream activity</b>	Release of hydraulic fluid	Machinery for in-stream use will utilize vegetable-based hydraulic oil
<b>Site Maintenance</b>	Disturbance of vegetation Establishment of weed species	Equipment moving from areas with non-native species onto natural areas must be clean and free of weeds Weed control will occur during active construction Disturbed areas will be immediately re-seeded and/or re-vegetated with approved species

### 3.4 Erosion & Sediment Control

*Provide project-specific erosion and sediment controls that are appropriate for the jurisdiction.*

Alberta Transportation, and The Cities of Calgary and Edmonton require Erosion and Sediment Control Reports and Drawings on construction projects; however, each jurisdiction has its own specific requirements (see Table 3-4).

Erosion and sedimentation are significant environmental concerns on construction projects. The Contractor must implement, inspect and maintain appropriate erosion and sediment control measures for the contract term.

**Table 3-4 Erosion and Sediment Control Requirements by Jurisdiction**

**Alberta Transportation and The City of Edmonton Requirements**

In the ECO Plan, descriptions and drawings of erosion and sediment control are required. Items that should be in the ECO Plan include but are not limited to:

- Text demonstrating the use of appropriate methods and materials and a corresponding drawing indicating the locations of erosion and sediment control near waterbodies. Erosion and sediment control measures should be included on the site drawing (Step 2.3).
- Documentation that shall be utilized by appointed staff for the monitoring of sediment and erosion control for the project site. The Contractor must ensure erosion and sediment control devices are in place and maintained during the contract term.

For Alberta Transportation projects refer to the *Alberta Transportation Erosion and Sediment Control Manual* (available at [www.transportation.alberta.ca](http://www.transportation.alberta.ca)). For City of Edmonton projects, refer to *The City of Edmonton Erosion and Sedimentation Control Guidelines* (available at [www.edmonton.ca](http://www.edmonton.ca)) for specific guidance.

**The City of Calgary Requirements**

City of Calgary projects that require an ECO Plan also require a separate Erosion and Sediment Control Report and/or Drawing(s) to be developed. The documents are to be reviewed, signed and stamped by a professional with experience in the design and implementation of erosion and sediment control who is a professional engineer (P.Eng.), professional licensee (P.L.(Eng.)) or professional agrologist (P.Ag.), or who holds a designation as a Certified Professional in Erosion and Sediment Control.

In the ECO Plan, indicate whether an Erosion and Sediment Control Report and/or Drawing was developed for the project. Include a complete citation for all Reports and Drawings submitted (i.e., Author, Full Title, Publication Date, Date submitted to The City of Calgary, the Business Unit [and contact person] that the Report and/or Drawing was submitted to, and the mode used to transmit the documents [e.g., email, fax, registered mail]).

The ECO Plan and the separate Erosion and Sediment Control Report and/or Drawing(s) must be submitted together to The City of Calgary Project Manager. The City of Calgary Environmental & Safety Management will review the ECO Plan, and The City of Calgary Water Resources will review the Erosion and Sediment Control Report and/or Drawing(s).

For more information on submission requirements, refer to the current edition of *The City of Calgary Guidelines for Erosion and Sediment Control* (available at [www.calgary.ca](http://www.calgary.ca)) or contact The City of Calgary Water Resources — Erosion and Sediment Control by phone at 3-1-1 (local Calgary calls only) or (403) 268-CITY (for callers outside Calgary).

The ECO Plan does not replace an Erosion and Sediment Control Report and/or Drawing(s).

### 3.5 Municipal Tree Protection

*Provide project-specific municipal tree protection measures that are appropriate for the jurisdiction.*

Construction work on, near or crossing City property can damage City-owned trees. Ninety-nine percent of a tree's roots are found within one meter of the soil surface and processes like moving heavy equipment near trees, changing the soil structure, paving over roots, breaking branches, scraping bark and excavating in the root zone can damage and even kill trees.

The Cities of Calgary and Edmonton both have municipal tree protection standards for construction projects; Table 3-5 summarizes their specific requirements.

Tree Protection Plans outline how construction work will be accomplished while protecting public trees. Tree Protection Plans are required for any development involving the following: excavation, storage of construction materials, or access routes for people and/or equipment within a certain distance of a City-owned tree. The Contractor must develop Tree Protection Plans, when needed, for their projects, and ensure that tree protection measures are in place and maintained during the contract term.

Please note that Tree Protection Plans are intended to protect only the trees themselves; trees with specific wildlife values (e.g., nesting or fledging birds, riparian habitat) may have additional regulatory requirements that apply to the project.

**Table 3-5 Tree Protection Requirements by Municipal Jurisdiction**

The City of Edmonton Requirements
<p><b>Prior to the start of construction, City of Edmonton urban foresters must be notified of any construction work planned within five meters of a City-owned tree.</b> City of Edmonton tree protection is mandated by the Corporate Tree Management Policy C456A and the Community Standards Bylaw 14600.</p> <p>In the ECO Plan, include a copy of the Tree Protection Plan developed for the project and summarize the required tree protection measures. The location of all City trees and associated tree protection measures should be included on the ECO Plan site drawing (Step 2.3).</p> <p>The City of Edmonton urban foresters will work with you to develop tree protection solutions and to reduce potential damage costs to your project. For more information or to inquire about tree ownership, call 3-1-1 (in Edmonton) or (780) 442-5311 (outside Edmonton), or email <a href="mailto:citytrees@edmonton.ca">citytrees@edmonton.ca</a>.</p>

**Table 3-5 Tree Protection Requirements by Jurisdiction (*cont'd*)**

**The City of Calgary Requirements**

**City of Calgary projects require a *Tree Protection Plan* and a *Tree Protection Plan Agreement* when construction or construction-related activities are to occur within six meters of a public tree.** Public trees, including trees growing in parks, natural areas, boulevards and road right-of-ways, are City of Calgary property. The protection of public trees is mandated by municipal bylaws, including the Tree Protection Bylaw 23M2002 and the Street Bylaw 20M88.

In the ECO Plan, indicate whether a Tree Protection Plan is required for the project and summarize the required tree protection measures. Please submit a copy of all Tree Protection Plan(s) and Agreement(s) required by the project and the ECO Plan together to The City of Calgary Project Manager. The City of Calgary Environmental & Safety Management will review the ECO Plan, and The City of Calgary Parks — Urban Forestry will review the Tree Protection Plan(s) and Agreement(s).

Note that the location of all City trees and associated tree protection measures should be included on the ECO Plan site drawing (Step 2.3).

For more information on Tree Protection Plans or to inquire about tree ownership, contact The City of Calgary Parks — Urban Forestry by phone at 3-1-1 (local Calgary calls only) or (403) 268-CITY (for callers outside Calgary).

The ECO Plan does not replace a Tree Protection Plan.

## Step 4 Hazardous Materials & Waste Management

STEP 4	<b>4.1 Hazardous Materials</b>	List every hazardous material to be used or stored on site by the Contractor and all sub-contractors. Describe specific handling, containment, storage and disposal methods for each hazardous material.
	<b>4.2 Waste Management</b>	List all anticipated hazardous and non-hazardous waste materials along with proper handling and disposal methods. As well, provide all additional jurisdiction-specific handling procedures.

### 4.1 Hazardous Materials

*List every hazardous material to be used or stored on site by the Contractor and all sub-contractors. Describe specific handling, containment, storage and disposal methods for each hazardous material.*

Hazardous materials are commonly used on construction sites. In this section, consider all the hazardous materials that will be used in the construction project and by the construction equipment (see Step 1.2). For example, be sure to include hazardous materials that will be required for equipment cleaning, maintenance and operations (e.g., diesel, propane, oil, lubricant, hydraulic fluid, antifreeze) as well as materials required for the project itself (e.g., caulking, paint, solvent, glue, pesticide).

The ECO Plan must identify every hazardous material to be used or stored on site by the Contractor and all sub-contractors, along with material-specific handling, containment, storage and disposal procedures (see example Table 4-1). These procedures must comply with all regulatory requirements; for example, materials must be stored specific distances back from waterbodies and storm sewers. The storage location(s) of hazardous materials must also be marked on the site drawing (Step 2.3).

The Contractor must keep all hazardous waste disposal receipts and manifests and maintain copies on site. The Cities of Edmonton and Calgary have additional hazardous waste management requirements; these are presented in Step 4.2.

**Table 4-1 Example: Hazardous Materials and Associated Handling Procedures**

Hazardous Material	User	Storage Location	Containment	Handling Procedure	Reuse, Recycling and/or Disposal Method
Diesel	Contractor, sub-contractor	Refuelling station (see Site Drawing, Step 2.3)	Double-walled fuel tank located on impervious tray with capacity to hold 110% of stored liquid volume.  Concrete barriers, fire extinguisher and no smoking sign erected.	On-site fuelling will follow best management practice XYZ described in Step 3.3 and provided in Appendix A.	Fuel tank will be reused on subsequent projects.
Lubricating Oil	Contractor	Storage locker in laydown area (see Site Drawing, Step 2.3)	Fire-proof containment locker.  All lubricating oil packaging clearly labelled with Contractor's name.	When lubricating oil is used, Contractor will provide secondary containment with capacity to hold 110% of stored liquid volume.	Storage locker(s) will be reused on subsequent projects.

## 4.2 Waste Management

*List all anticipated hazardous and non-hazardous waste materials along with proper handling and disposal methods. Provide all additional jurisdiction-specific handling procedures.*

Construction projects generate waste materials; these materials fall into two broad categories, as follows:

- waste generated as part of the contract deliverable (e.g., concrete and wood demolition waste)
- waste generated by the Contactor's activities, such as oil filters, oils, plastic, cardboard, paints, solvents, spill clean-up materials and sewage

The ECO Plan must identify every hazardous and non-hazardous waste product to be produced by the project, and specify its appropriate handling and disposal procedure (see example Table 4-2). These procedures must comply with applicable regulatory requirements. The Contractor must keep all hazardous and non-hazardous waste disposal receipts and manifests. All waste storage locations must be shown on the site drawing (Step 2.3).

Contractors shall reuse or recycle their hazardous and non-hazardous waste materials when possible. The Cities of Calgary and Edmonton have specific additional landfill diversion and recycling requirements (see Table 4-3, next page). When evaluating recycling options, contractors may wish to consult Alberta's Recycling Hotline ([www.recyclinghotline.ca](http://www.recyclinghotline.ca); 1-800-463-6326); this tool allows users to match a wide range of waste materials with suitable local recycling depots.

**Table 4-2 Example: Waste Material Handling and Disposal Procedures**

Waste Material	Handling Procedure	Reuse, Recycling and/or Disposal Method
<b>Non-Hazardous Waste Materials</b>		
Concrete	Break up and put in concrete bin	Recycle <i>(provide Recycling Company name &amp; location)</i>
Wood	Stack reusable boards next to supply of new form boards for reuse; recycle clean unusable forms in wood recycling bin	Scraps used for formwork, remaining recycled <i>(provide Recycling Company name &amp; location)</i>
Road Asphalt	Truck directly to vendor as asphalt is stripped/removed	Recycle <i>(provide Recycling Company name &amp; location)</i>
Drywall	Truck directly to vendor as drywall is removed	Recycle <i>(provide Recycling Company name &amp; location)</i>
Paper & Cardboard	Bundle (if needed) and put in covered paper and cardboard recycling bins	Minimize on-site paper use; when needed, print double-sided and black & white (if possible); then Recycle <i>(provide Recycling Company names &amp; locations)</i>
Clear Plastic Film	Bundle and put in covered plastic bin	Recycle <i>(provide Recycling Company name &amp; location)</i>
<b>Hazardous Waste Materials</b>		
Epoxy	Stockpiled separately	Container returned to distributor
Concrete washout	All washout contained in a designated lined area or in a self-contained concrete washout system	Recycle <i>(provide Recycling Company name)</i>

The Cities of Calgary and Edmonton both have additional waste management requirements for construction projects. These are detailed in Table 4-3.

**Table 4-3 Waste Management Requirements by Municipal Jurisdiction**

The City of Edmonton Requirements
<p>When working for The City of Edmonton, hazardous waste handling procedures must be included in the ECO Plan. Hazardous waste manifest or recycle dockets must be completed and appropriate copies maintained on site or by the generator when disposing hazardous waste or hazardous recyclables.</p> <p>The Contractor must identify all waste streams and disposal methods (i.e., diverted from the landfill, recycled or land-filled). Contractors shall document / recycle / divert materials as per their contractual agreement. Table 4-2 provides an example of how to summarize the project's waste management.</p>
The City of Calgary Requirements
<p>When working for The City of Calgary, the Contractor must identify how waste will be reduced and diverted from the landfill or recycled. At a minimum, the Contractor will recycle cardboard, paper, recyclable wood, drywall, asphalt (both road asphalt and asphalt shingles), concrete, brick and masonry block, scrap metals and clear plastic film (polyethylene) <i>or</i> provide written justification for not diverting any of these waste streams. Table 4-2 provides an example of how to summarize this component of project waste management.</p> <p>The City of Calgary is tracking its quantities of re-used, recycled and landfilled waste associated with capital construction projects. The City of Calgary requests that contractors use form TS 5377 (<a href="#">Construction Waste Diversion &amp; Disposal Report</a>; Internet Explorer required) to summarize their waste disposal and diversion activities. Contractors are also required to retain and submit copies of <u>all</u> waste disposal and diversion records (e.g., bills of lading, waybills, weigh slips, waste manifests, tipping receipts, waste disposal receipts) for materials disposed and those recycled or reused. Completed Form TS 5377 together with all associated waste disposal and diversion receipts must be submitted within two weeks of disposal or diversion to the following email: <a href="mailto:ECOPlan.waste@calgary.ca">ECOPlan.waste@calgary.ca</a>.</p>



## Step 5 ECO Plan Implementation

<b>STEP 5</b>	<b>5.1 On-Site Representative</b>	Provide the name(s) and contact details for the Contractor's On-Site Representative(s).
	<b>5.2 Training &amp; Communication</b>	Detail the procedures that will be used to train staff and sub-contractors in their ECO Plan responsibilities.
	<b>5.3 Monitoring &amp; Reporting</b>	Describe monitoring and inspection procedures that suit the nature and scale of the project and meet regulatory and contractual requirements.
	<b>5.4 Documentation</b>	Describe the environmental information and ECO Plan records that will be kept in up-to-date hard copies on the project site.
	<b>5.5 ECO Plan Update</b>	Provide ECO Plan review and update procedures. Append a current ECO Plan Revision Summary table (e.g., Table 5-3) to all updated ECO Plans.

### 5.1 Contractor's On-Site Representative

*Provide the name(s) and contact details for the Contractor's On-Site Representative(s).*

The Contractor must identify an on-site individual to be their On-Site Representative; this individual is responsible for maintaining the environmental controls and addressing any environmental issues or questions that arise. The Contractor must identify their On-Site Representative on the ECO Plan Checklist and at the pre-construction meeting.

In this section, provide the name(s) and full contact details for the Contractor's On-Site Representative.

## 5.2 Training & Communication

*Detail the procedures that will be used to train staff and sub-contractors in their ECO Plan responsibilities.*

The Contractor must ensure that their workers are aware of applicable environmental legislation and project-specific requirements before construction starts. Anyone on a construction site could negatively impact the environment. To ensure environmental protection, it is essential to train all staff (including sub-contractors) in their specific environmental responsibilities.

ECO Plans must be included as a topic in site orientations, pre-construction meetings and regular site meetings. Minutes of these meetings must be retained and available upon request. Topics for training and awareness sessions may include (but are not limited to) those listed in Table 5-1.

**Table 5-1 Potential Topics for ECO Plan Training and Awareness Sessions**

ECO Plan Training and Awareness — Potential Topics
ECO Plan Content & On-site Location
ECO Plan Team Roles & Responsibilities
Locations of Environmental Restrictions (e.g., wetlands, rare plants, bird nests, riparian areas)
Requirements of Project Permits, Approvals, Authorizations & Notifications
Regulatory, Policy & Program Compliance Measures
Potential Environmental Impacts, Mitigation Measures & Best Management Practices
Erosion & Sediment Control
Municipal Tree Protection
Hazardous Materials & Waste Management
Monitoring & Reporting Procedures
Environmental Emergency Response Procedures (including locations of spill kits, contact information, etc.)

### 5.3 Monitoring & Reporting

*Provide monitoring and inspection procedures that suit the nature and scale of the project, and that satisfy regulatory and contractual requirements.*

The Contractor will develop monitoring and inspection procedures that satisfy the contract terms and conditions and all regulatory requirements. The monitoring and inspection procedures must also be appropriate for the nature and scale of the project, as well as the site characteristics, work activities and potential environmental risks associated with the project.

The Contractor is responsible for understanding and complying with the reporting requirements, and ensuring that all of the environmental controls are working.

The Contractor must include the following project-specific information in this section:

- locations and items to be inspected
- monitoring frequency
- monitoring during scheduled shut-downs
- reporting requirements related to permits, approvals, authorizations and notifications

Deficiencies identified during monitoring activities must be immediately addressed.

### 5.4 Documentation

*Describe the environmental information and ECO Plan records that will be kept in up-to-date hard copies on the project site. These documents must always be available for inspection or review.*

A master hard copy of documents relating to the ECO Plan and the project's environmental activities must be retained at the construction site and available for inspection at all times. These documents must be kept current and be available to all personnel. Table 5-2 provides a non-comprehensive list of the types of documents that should be maintained as up-to-date hard copies on the project site.

**Table 5-2 Example Types of Documentation to be Retained on the Project Site in Hard Copy**

Example — Hard Copy Documentation to be Retained on the Project Site
Current ECO Plan
Current Erosion and Sediment Control Report and/or Drawing(s)
Current Municipal Tree Protection Plan
Regulatory Permits, Approvals, Authorizations and/or Notifications, as well as their applications when relevant (often the application forms part of the approval)
Record of Environmental Incidents (e.g., spill and release records)
Hazardous Materials Inventory
Hazardous and Non-Hazardous Waste Materials Inventory
Completed Environmental Monitoring Records
Site Orientation, Tailgate Meeting and Project Progress Minutes
Construction Equipment Inspection Logs (to ensure that the equipment is inspected before coming on site be certain that the equipment is, for example, weed-free and/or leak-free)
Fuelling Logs
Relevant Memos Relating to Environmental Matters

## 5.5 ECO Plan Update

*In this section, provide ECO Plan review and update procedures; include a list of people who will be contacted when the ECO Plan changes.*

*If an update to the ECO Plan is required, attach a completed revision summary table (such as Table 5-3) to all subsequent versions of the document.*

In this section, provide ECO Plan update procedures; include a circulation list for updated ECO Plans. ECO Plan updates are generally required in two circumstances:

- when an ECO Plan is deficient and returned to the Contractor for revision prior to the start of construction
- when the project, its site conditions and/or its activities change in a way not anticipated in the original ECO Plan

If an ECO Plan is determined to be deficient at the review stage, the Contractor must modify and complete it to the mutual satisfaction of all parties. No work may begin until all parties have agreed to the ECO Plan.

ECO Plans must be updated when the project, its site conditions and/or its activities change in a way not anticipated in the original document. ECO Plans must provide details to continually meet environmental requirements and proactively protect the environment. For example, in the case of an unplanned winter shut-down, the ECO Plan must be revised to include the procedures and environmental protection measures required for the shut-down period.

Once the ECO Plan is updated, the Contractor is responsible for notifying (as appropriate) Alberta Transportation, The City of Calgary and/or The City of Edmonton of the changes prior to implementation. The Contractor shall communicate the changes to employees and relevant sub-contractors, and provide the necessary training before implementing the changes. Modifications to the ECO Plan must provide an equal or better level of avoidance or mitigation.

All changes to the ECO Plan must be documented (include a revision summary table such as Table 5-3). Clearly summarize what the changes are and where they are located in the document, referencing applicable sections, pages, drawings and/or table numbers. This revision summary table should be located at the front of the revised ECO Plan (just after the cover page). Forward the revised ECO Plan to the reviewer (i.e., The City of Calgary, The City of Edmonton or the consultant for Alberta Transportation projects) and other applicable parties.

**Table 5-3 Example: ECO Plan Revision Summary Table**

Date	ECO Plan Section	Specific Document Reference (Page #, Drawing # or Table #)	Description of Change
25 Jun 2017	2.2	Page 4	Modify Step 2.2 to add "Environmental Site Information Reports (i.e., Phase II ESA, remediation reports)" to the list of documents to be reviewed.
	2.3	Drawing 2-3	Add Spill Kit location to Site Drawing 2-3.
	5.3	Page 25	Modify Table 5-16 to add "Fisheries and Oceans Canada" to the list of regulatory agencies that will be contacted.
28 Aug 2017	6.1	Page 32	In paragraph 5, change the words, "investigate the release", to the words "review details of the release".



## Step 6 Environmental Emergency Procedures

STEP 6	<p><b>6.1 Environmental Emergency Prevention &amp; Response</b></p>	<p>Identify potential incidents that may impact the environment and provide appropriate prevention and emergency response procedures.</p> <p>Provide a current emergency contact list and describe where it will be posted on site.</p>
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### 6.1 Environmental Emergency Prevention & Response

*In this section, identify project-related potential incidents that may impact the environment, and provide details or copies of prevention and emergency response procedures. In addition, provide a current emergency contact list and describe where it will be posted on site.*

The ECO Plan must identify potential project-related incidents that may impact the environment. These incidents could be the result of natural events, accidents, human error or improper work practices.

Examples of potential incidents include:

- contaminant spills and releases to land, water and air from fuels, oils, lubricants and chemicals
- discovery of historic contamination
- erosion events of land (e.g., water, wind), watercourses (e.g., bank erosion, flooding), berms and coffer dams

The ECO Plan must provide emergency procedures to prevent and respond to potential incidents that may impact the environment. The emergency response procedures must include:

- training provisions to make Contractor staff and sub-contractors aware of their responsibilities during emergency situations
- a list of equipment and materials available on site including their specific location

- initial response to an emergency, describing the steps to be taken and equipment to be used
- immediate reporting of environmental incidents to appropriate authorities
- post-emergency review, follow-up and improvement of procedures as needed

The Contractor is responsible to ensure that each emergency response procedure reflects the current, specific requirements of the relevant jurisdiction.

At a minimum, each ECO Plan must include contamination discovery and release reporting emergency response procedures. As a City of Edmonton, Alberta Transportation and/or City of Calgary Contractor, you have specific responsibilities associated with the reporting, prevention, control and clean up of spills or releases that you may cause or discover. The immediate reporting of environmental releases and spills is a requirement of provincial and federal environmental legislation.

The ECO Plan must include a current emergency contact list and describe where it will be posted on site. This list must include names and contact details for key personnel and applicable regulatory agencies.