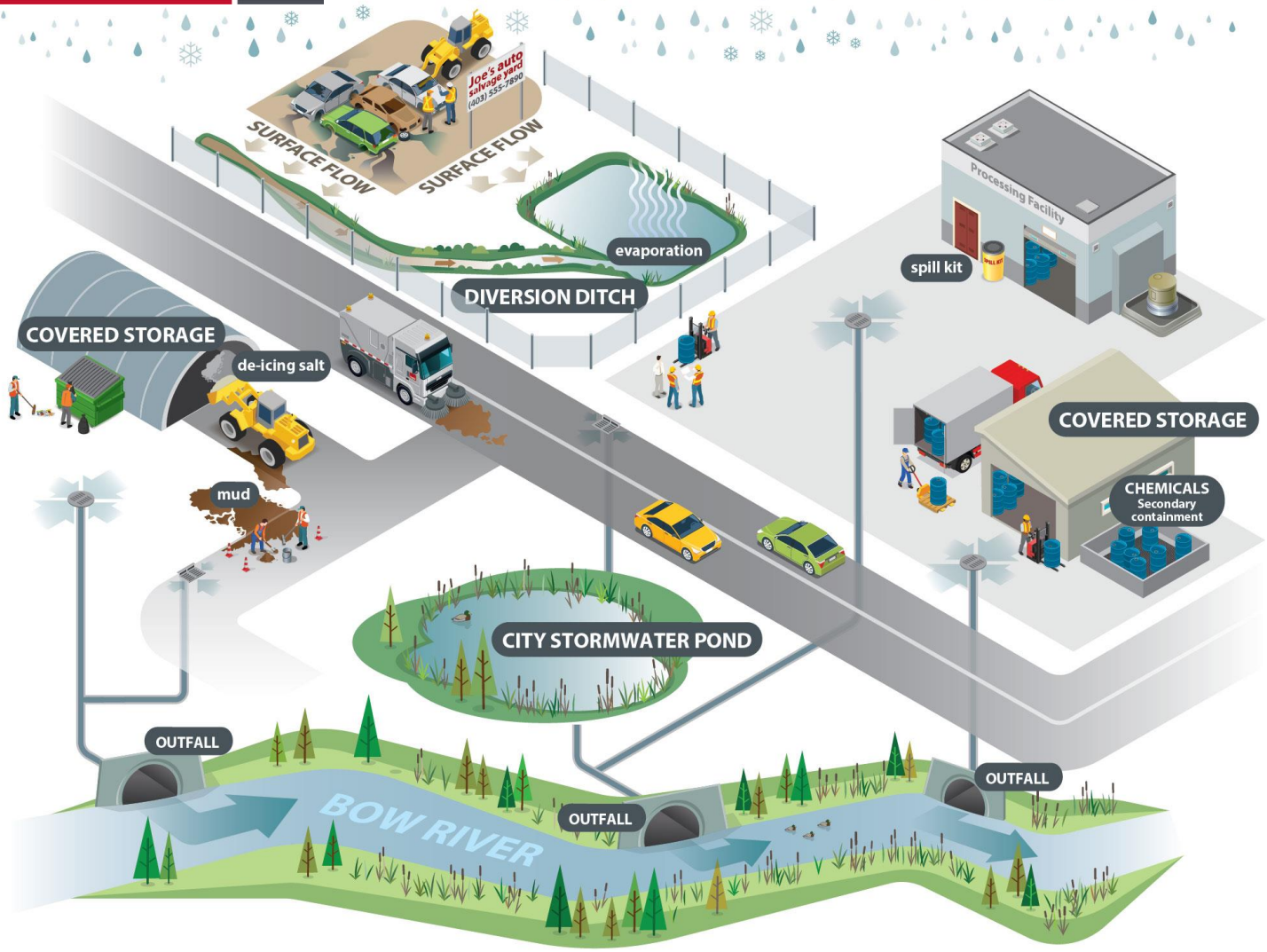

Stormwater pollution prevention guide

for industrial, commercial and institutional (ICI) facilities

ICI facilities and stormwater

Industrial, commercial and institutional (ICI) facilities are those businesses that perform a portion of their activities in outdoor areas exposed to the elements (e.g., material storage, handling and processing, vehicle fueling and maintenance, shipping and receiving, chemical storage). Every time it rains, or snow melts the outside areas of industrial, commercial, and institutional facilities get a bath. Dirt, oil, gasoline, garbage, and industrial chemicals and materials associated with ICI facilities can be washed from these surfaces into storm drains. This water, called stormwater, and the pollutants within it flow for the most part directly into our rivers through stormwater outfalls – the concrete drains you see along the river. Stormwater can affect the health of our streams, rivers and the land surrounding them, as well as the health of the wildlife and fish that rely on them.

We all have a shared responsibility to control both the amount and quality of stormwater released into our rivers.

Common sources of stormwater pollution at ICI facilities

Runoff from areas where industrial and commercial activities occur can pick up and transport pollutants (e.g. heavy metals, oil and grease, garbage, salt, sediment). Activities such as vehicle storage and maintenance, material handling, and salt storage are often conducted in outside areas exposed to the elements. Accidental spills and leaks, improper waste disposal, and discharges of chemicals or waste to storm inlets are also common sources of stormwater pollution. There are five common categories of outdoor activities that can be major sources of stormwater pollution (See Figure 1).

- **Loading and Unloading:** Transfer of materials to a facility (e.g. by pump, conveyor, forklift transfer of containers) can result in spillage. Accumulated materials can be washed away in runoff.
- **Outdoor Storage:** Materials such as fuel, raw materials, process residuals, and waste are often stored in containers, on platforms or pads, or stockpiled. Some materials are carried or dissolved in stormwater runoff.
- **Outdoor Work:** Activities such as outdoor vehicle and equipment maintenance, equipment washing, and concrete mixing can result in material spills which run directly into the stormwater system or are transported in runoff.
- **Dust Generating Work and Facilities:** Dust generated during industrial processes as well as process residuals and exposed soil at the facility can become wind-borne. Stormwater runoff can erode and transport sediment, dust and other fine material.
- **Cross connections to the stormwater system:** Sometimes facilities have known or unknown connections to the stormwater system which allow liquid waste or other process material to be discharged directly or indirectly into to stormwater system. These discharges often contain materials that are prohibited under *The City of Calgary's Stormwater Bylaw (37M2005).*

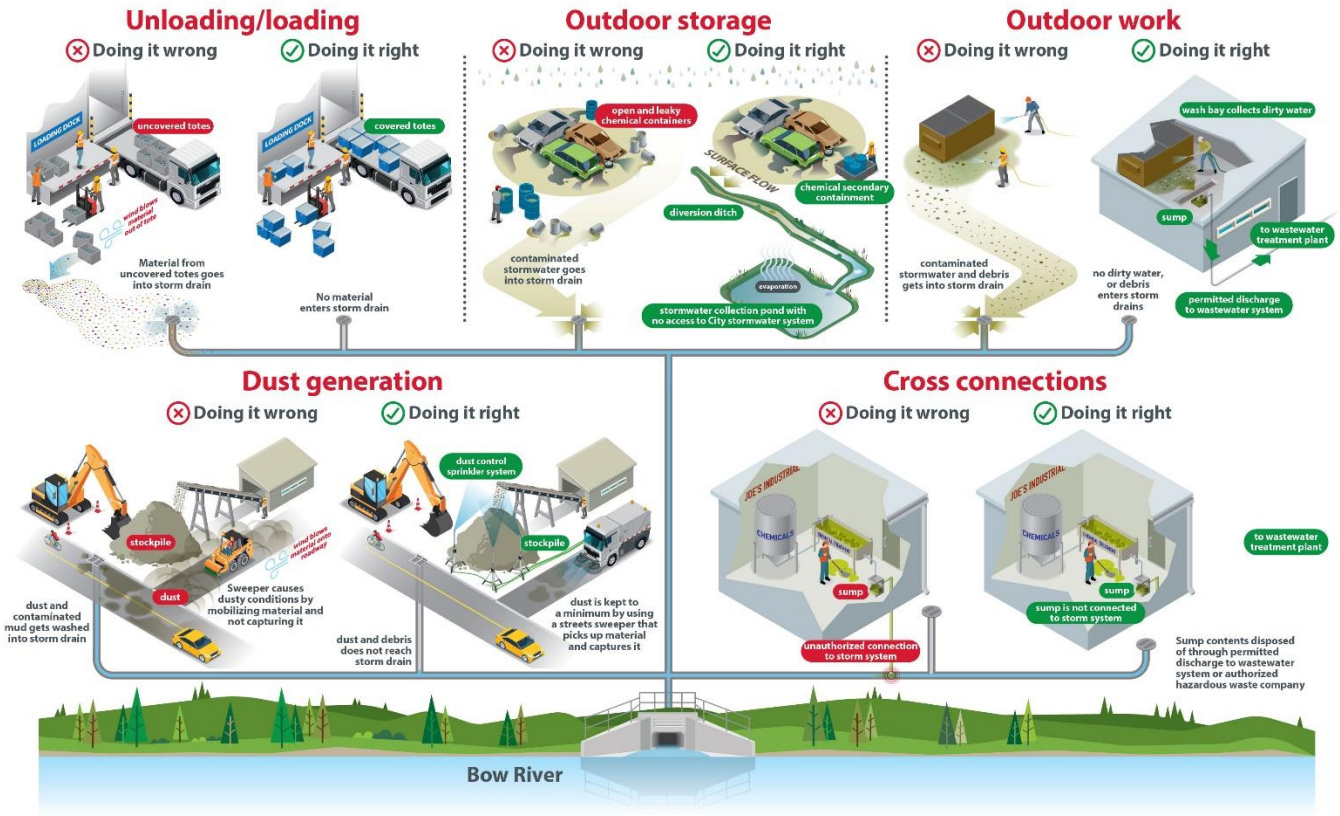

Figure 1 – There's a right way and a wrong way to manage pollutant sources on your site.

Steps to prevent stormwater pollution at your facility

Step 1: Map your facility

Start by gaining a good understanding of the activities at your facility by conducting a detailed walk of all outdoor areas of the facility and reviewing each of the categories of stormwater pollutant sources summarized below. It is useful to sketch a map of your facility for this work. Where possible, you should also identify points of access to the stormwater system (e.g. stormwater catch basins, grated-top manholes, culverts, overland drainage channels, etc.).

A site map is a helpful tool for stormwater pollution prevention planning. Refer to Figure 2 and the Map Your Site Information Sheet and map template available at calgary.ca/stmpp for more information. By mapping your facility, you will:

- Understand the direction stormwater flows throughout your facility.
- Identify potential pollutant sources that may be transported in stormwater runoff.
- Plan cost-effective, practical best practices to reduce stormwater pollution.

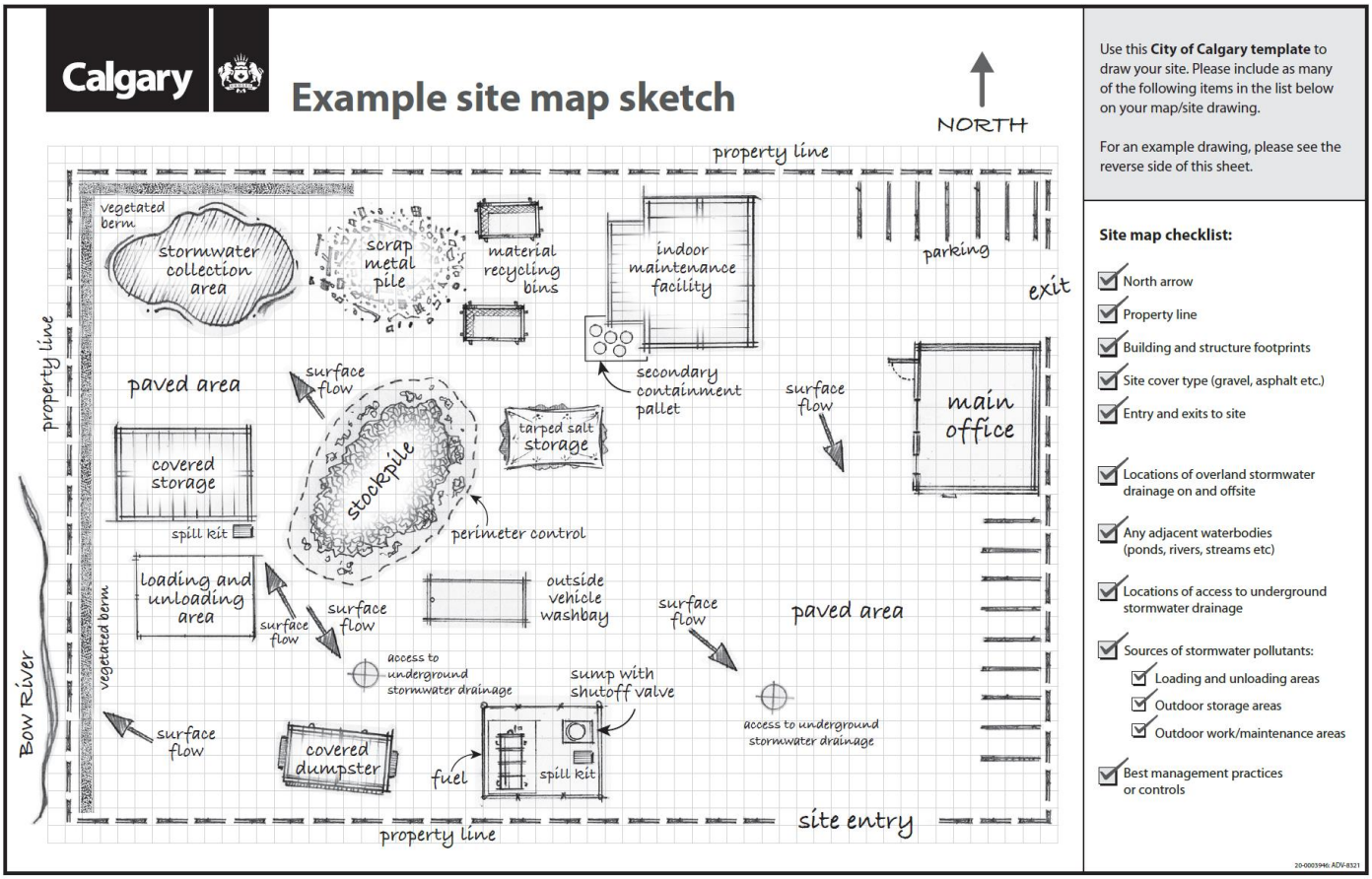

Figure 2 – Example of a site map sketch using the downloadable template and checklist

Step 2: Implement stormwater pollution prevention practices

Prevent pollution at the source

Best management practices (BMPs) are used to prevent or reduce the discharge of pollutants in stormwater. When selecting BMPs, focus on practices geared towards reducing pollutants at the source (you might hear these referred to as **source control practices**). Common source control BMPs are categorized and described below. See Figure 3 for an illustration of each category.

1. **Minimize Exposure**
   Minimize the exposure of materials and activities to rain and snowmelt by locating them indoors or using proper containment measures.

2. **Keep a Tidy Site**
   Maintaining a clean and orderly facility is a practical and cost-effective way to prevent potential pollutant sources from contacting stormwater. Practices are often referred to as good housekeeping and include sweeping, keeping lids closed on dumpsters, installing storm inlet filters. These good housekeeping practices keep exposed areas free of waste, garbage and floatable debris so that it does not leave the facility.

3. **Manage Runoff**
   Managing stormwater runoff that flows through or ponds at your facility is an effective way to reduce stormwater pollution. Practices are very site-specific, but may include vegetated swales, berms, collection and reuse of stormwater, stormwater inlet controls, snow management, and infiltration practices.

4. **Erosion and Sediment Control**
   Some industrial, commercial and institutional facilities also have exposed soil or manage erodible material such as sand, soil, drywall or ready-mix concrete. In general, erosion control practices which prevent soil or sediments from becoming mobilized should be used as a first line of defense, while sediment control practices (which trap, infiltrate or settle out mobilized sediment), should be used as a back-up to the erosion control measures. For more information, consult with one of The City's Stormwater Pollution Prevention Team (StmPP) staff or refer to The City of Calgary Guidelines for Erosion and Sediment Control.

5. **Prevent and Manage Spills**
   Spills of chemicals and other materials are avoidable with a little planning and use of some effective procedures and practices. As mentioned in the previous section, mapping your site will help identify areas where spills could occur. Once these areas are identified, primary containment (the receptacle in which the substance or material is contained during normal operation) should be inspected and replaced if compromised. Following this, secondary containment (which provides temporary containment of any substance or material from primary container until the appropriate spill response is implemented) should be in place and in good condition. Be sure to choose the correct containment practice for the situation or equipment.

6. **Inspection and Maintenance**
   Regular inspection, testing, and the preventative maintenance and repair of outdoor equipment (both stationary and mobile) prevents or minimizes leaks and releases of other pollutants. Keeping good maintenance records will help you prevent stormwater pollution by keeping controls in good working condition and ensure practices are being followed.

Figure 3 – Management practices to address stormwater pollution

Step 3: Inspection, maintenance and documentation

Primary and secondary containment along with other BMPs are only effective if they are maintained and ready for a spill. Maintenance is best monitored by implementing an inspection program for your site. Inspections should be conducted at a frequency that is most appropriate for your site. It is recommended that these inspections take place on a seven-day frequency, but this will depend on type of BMPs used on site and the volume of stormwater your site generates. A site inspection form can be used to document your site inspections and any maintenance performed.

Visit **calgary.ca/stmpp** for more information about preventing stormwater pollution at your facility and to access downloadable resources and templates.