



Title	ES-301-7.01 MS4 Operations and Maintenance Procedures for DEN
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1) Activity Description: MS4 Maintenance and Operations Procedures for DEN

This Environmental Guideline (EG) applies to MS4 related operations and maintenance activities as described in the City and County of Denver's MS4 Permit (Part I.B.1.e) conducted by DEN employees. This EG describes the Best Management Practices (BMPs) developed, adopted, and implemented by DEN to primarily prevent or reduce pollutants in runoff from the following activities;

- New Municipal Building and Facility Construction
- Street Maintenance, Replacement, Construction
- Snow Removal
- Street Sweeping
- Large Outdoor Festivals and Events
- Parks and Open Space Maintenance

* This EG is one of several specifically identified procedures for activities/facilities that are required by the Pollution Prevention/Good Housekeeping section of CCD's MS4 permit. Related procedures not specially addressed in this EG include, but not limited to, those identified in the Reference section of this document.

2) Potential Environmental Risks

A. The following environmental concerns are associated with these activities:

- Fuel spills
- Air pollution & odors
- Improper or inappropriate disposal of Wastes
- Sanitary sewer overflow
- Contamination of ground water
- Collection of wash water
- Improper or inappropriate disposal of pesticides and herbicides
- Disposal of contaminated spill response media
- Sediment & erosion
- Contamination of soils
- Contamination of surface water
- Adverse impacts to Wildlife/Protected Species
- Adverse impacts to non-target organisms
- Adverse impacts to wetlands

B. Potential consequences from performing the activity incorrectly:

- Personal injury, property damage, or long-term damage to the environment
- Possible regulatory noncompliance, Notices of Violation, and related [financial & non-financial] penalties

3) Activity Descriptions:

New Municipal Building and Facility Construction:

New construction includes, but is not limited to buildings, structures, capital improvements, roadways, and recreational components such as trails, restrooms, and

other structures. Procedures provided are general in nature and may apply to any scale or type of municipal construction.

Street Maintenance, Replacement, Construction:

Street, curb, and gutter activities include concrete and asphalt installation, maintenance, repair, replacement, and construction; bridge maintenance; and painting and striping. All of these activities have the potential to impact stormwater quality.

Snow Removal:

Deicers are commonly used during snow removal activities. Improper handling of deicers can contribute pollutants to waterways. Deicers can contaminate surface and ground water and damage vegetation adjacent to roadways. Deicers will change the chemical balance of local waterways and can be picked up by stormwater resulting in higher dissolved and suspended sediment loads in waterways. Deicers also present an air quality concern. Snow may have to be stored during major winter storms to increase accessibility. It is possible for pollutants such as sediment, organics, oil, and grease to be concentrated at snow storage locations and to impact stormwater quality.

Street Sweeping:

Street sweeping can prevent pollutants such as sediment particles, organics, oil, grease, trash, road salt, and trace metals from entering and plugging the storm sewer system. The operation and maintenance of street sweepers, if not conducted properly, can contribute to stormwater pollution.

Large Outdoor Festivals and Events:

Although these activities are not typically held at DEN, large outdoor festivals have the potential to impact stormwater quality. A “large” event is generally defined as having all of the following: portable toilets, trash receptacles, prepared food and beverage vendors, and street closures.

Parks and Open Space Maintenance:

These maintenance activities are conducted by various agencies at DEN and involve the operation of equipment such as mowers and tractors; disposal of waste from mowing, planting, weeding, raking, pruning and trash collection; and application of pesticides, herbicides and fertilizers.

4) Critical Requirements and Tasks for MS4 Operations and Maintenance Procedures

A. General Considerations

- i) Obtain all applicable federal, state, and local permits for construction projects
 - (1) Either one or both the Colorado Stormwater Construction General permit and/or the Denver Construction Activities Stormwater Discharge Permit apply to construction sites meet one or more of the following criteria:
 - (a) Disturbing one acre or more, or less than one acre but part of a larger common plan of development,

- (b) Are part of a larger common plan of development is defined as a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan,
 - (c) The site has been identified as having a significant potential for erosion, based on site characteristics including steep topography,
 - (d) The site is not known to contain contaminated soils or pre-existing environmental impairment, and
 - (e) The site is not directly adjacent to receiving waters (i.e. creek, stream, river, pond, lake, etc.).
- (2) A dewatering permit may be required if construction activities require the removal and discharge of groundwater offsite.
- (3) A U.S. Army Corp of Engineers (USACE) Section 404 Permit may be needed if the work will be conducted in or impact waters of the United States, including wetlands, washes, drainages, ditches, creeks, streams, and rivers.
- ii) Applicable sediment and erosion controls shall be installed to prevent illegal discharges to the storm sewer or waterways, such as inlet protection, silt fence, sediment traps, erosion control logs, check dams, and vehicle tracking control. Sediment and erosion controls will be installed and maintained in accordance with approved design criteria and/or industry standards.
 - iii) Where practicable, non-structural controls will be used, such as phased construction, dust control, good housekeeping practices (daily sweeping), and spill prevention and response procedures.
 - iv) Protect storm drain inlets and drains with curb socks, rock berms, inlet protection, or drain covers/mats prior to any activity.
 - v) Where feasible, schedule maintenance activities during dry weather.
 - vi) Stay alert for any signs of illicit discharges. This includes “dry weather” flows or pipes or hoses emptying directly into waterways or the storm sewer system.
 - vii) Leaking material containers should be properly discarded and replaced.
 - viii) Store materials in containers under cover when not in use and away from any storm drain inlet.
 - ix) Monitor equipment for leaks and use drip pans as necessary.
 - x) Sweep or vacuum the roadway once activities are complete.

B. Employee Training

- i) Training will be conducted as necessary to conduct the Activity as described herein and to inform employees of impacts associated with illegal discharges and improper disposal of waste from municipal operations.
- ii) Records of on-the-job training are not required. Records of formal employee training, if provided, shall be retained.

C. Storage & Material Handling Requirements

- i) Store materials per RCRA-approved methods.
- ii) Maintain legible labels and markings on all containers and tanks.

- iii) Ensure adequate secondary containment for all bulk storage containers, and that all containers and containment are in good operating condition.

D. Emergency Response

- i) Call DEN Communications Center immediately at 303-342-4200 for all spills.
- ii) If a spill occurs, refer to Environmental Guideline ES-301-5.02 Spill Response.
- iii) Control spills to minimize property damage and eliminate imminent risk to human health and the environment.
- iv) Containerize all collected wastes and evaluate for labeling, storage and disposal.

5) **Specific Operating Requirements for:**

- New Municipal Building and Facility Construction
- Street Maintenance, Replacement, Construction

Expected Records / Outputs: None.

Concrete and Asphalt Work

- Minimize the drift of chemical cure on windy days by using the curing compound sparingly and applying it close to the concrete surface.
- Ensure there is a concrete truck washout area available. Wash out mixers, delivery trucks, or other equipment in the designated concrete washout area only.
- Whenever possible, recycle concrete and asphalt rubble; otherwise, dispose of it as solid waste.
- When saw cutting concrete, ensure that no slurry enters the storm drain. Vacuum wet materials and allow too dry in a separate container, which can then be disposed of properly as solid waste. Alternatively, let the slurry dry on the surface, sweep it up, and properly dispose of the sweepings as solid waste.
- Whenever possible recycle concrete and asphalt. If impossible, dispose of as solid waste.

Roadway Milling and Overlay

- Sweep to minimize sand and gravel from new asphalt from getting into storm drains, streets, and creeks.
- Do not allow asphaltic concrete grindings, pieces, or chunks used in embankments or shoulder backing to enter any storm drain or watercourses. Apply temporary perimeter controls. Install silt fence until the structure is stabilized or permanent controls are in place.
- Whenever possible recycle concrete and asphalt. If impossible, dispose of as solid waste.
- Drainage inlet structures should be covered with inlet protection during application of seal coat, tack coat, slurry seal, and/or fog seal.
- Control the placement of road base or asphalt used in embankments or shoulder backing; do not allow these materials to fall into any storm drain or watercourses.

Bridge Work

- Do not transfer or load any materials directly over waterways.
- Secure lids and caps on all containers when on bridges.

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- Suspend drop cloths or nets below any bridgework where wastes, scraps, or drips might be spilled into a waterway.

Painting and Striping

- If possible, schedule painting and striping projects during dry weather.
- Use thermoplastic or epoxy markings in place of paint whenever feasible.
- The pre-heater for thermoplastic striping and the melting tanks used during pavement marking should be filled carefully to prevent splashing or spilling of materials. When feasible leave 6 inches at the top of pre-heater and the melting tanks to allow room for material to move and splash when vehicles are deadheaded.

6) Specific Operating Requirements for:

- Snow Removal

Expected Records / Outputs:

- The following shall be reported to DEN ES annually for inclusion into the MS4 Annual Report per Reg. 16 street sanding data.
 - Number of full deployments
 - Number of line miles treated
 - Tons of Squeegee and salt used
 - Tons of Meltdown 20™ used
 - Gallons of Apex liquid pavement deicer used

Plowing

- Inspect plowing equipment for leaks prior to use and respond to these and other spills per the Spill Response procedures listed in “References” section below.
- Take care when connecting or releasing plow shovels and clean up any hydraulic fluid that may leak onto the pavement.
- Wash snow removal equipment only at approved washing stations.
- Do not pile snow in front of storm sewer inlets to allow inflow of snowmelt runoff.

Deicer Application

- Apply only the recommended amount of deicer to roadways.
- Spreaders should be calibrated at the beginning of each season and inspections for maintenance or repair should be conducted after each storm.
- As soon as weather conditions allow, follow-up with street sweeping to remove remaining deicer from roadways.

Ice Cutting

- Gutters and storm sewer inlets should be cleared of ice to allow drainage of snowmelt or ice-melt.

Solid Deicer Storage

- Deicers should be stored under cover, such as inside a covered structure or under a tarp.

- Containment barriers should be placed to prevent transport of the material beyond the storage area unless stored inside a structure.
- Any temporary salt and sand storage areas should be protected from erosive forces of wind and rain.
- Do not overload material spreaders.
- Sweep the area outside of the material storage area after loading and unloading.

Liquid Deicer Storage

- Utilize liquid deicer inventory controls to minimize the amount of deicer used and stored.
- Store tanks/containers in a location where they will not be accidentally damaged by equipment or vehicles.
- Periodically inspect storage tanks/containers to ensure that all materials are being stored properly when not in use.
- Clean the storage tank/container area when necessary using dry cleanup methods.
- Follow all State and Federal storage tank requirements
- When receiving bulk deliveries or when loading liquid deicers into truck mounted tanks, minimize leaks and clean up spills as soon as they occur.

Snow Storage

- Snow should be stored away from storm sewer inlets and waterways.
- When possible, snow should be stored on a pervious surface to allow infiltration.
- Snowmelt runoff should be routed through a best management practice (e.g., stormceptor, extended detention basin, oil/water separator, vegetated buffer) prior to reaching a waterbody.
- Sweep or vacuum impervious snow storage areas once snow has melted.

7) Specific Operating Requirements for:

- Street Sweeping

Expected Records/Outputs:

- The following records could be used to document activities performed:
 - Log of the number of curb-miles swept each year.

Use of Wash Bay Facilities

- Whenever possible, equipment shall be cleaned in an approved wash facility with appropriate drains and runoff protection.
- This should include the daily cleaning of street sweepers, post-snow event cleaning of plows and spreaders, and cleaning of light vehicles.

Field Flushing of Sweepers

- Operation of most types of street sweepers requires flushing of the belt during the day.
- Flushing in the field may be performed only when appropriate curb inlet protection is provided to keep sediment from entering the storm drainage system.
- Operators should have approved inlet protection devices and clean up residual sediment.

Heavy Equipment Cleanup in the Field. Equipment cleanup practices include the following measures

- Use of approved cleaners on all equipment;
- Daily cleaning of equipment will be done in as protected a location as is practical on-site, and appropriate monitoring and containment measures will be implemented to protect water sources.
- The standard practice will be to clean equipment on the prepared site for the following day's work, using limited cleaning materials so that no runoff occurs.

Sweeper Debris Disposal

- Do not empty sweeper hoppers, even temporarily, onto areas near storm drains or surface water bodies or where wind or rain could wash the debris into the storm sewer system or scatter the debris.
- Temporary storage areas for debris need to be protected from wind, rain, and surface runoff (when applicable).
- Dispose of sweeper debris at a designated dump site or at the designated area at the municipal facility.
- If unusual sweeping materials are identified, bring the issue to the attention of a supervisor for evaluation and proper disposal.
- If dirt or traffic accident debris is swept up, it must be disposed of properly.

8) Specific Operating Requirements for:

- Large Outdoor Festivals & Events

Expected Records / Outputs: None.

Storm Sewer System

- Control spills to minimize property damage and eliminate imminent risk to human health and the environment.
- Provide and adequately maintain trash receptacles for vendors and guests.
- Store waste containers under cover or on grassy areas, if possible.
- Do not wash out trash receptacles unless wash water will be discharged to the sanitary sewer.
- Walk the outdoor festival and event area during and after every large event to pick up loose trash and debris. Properly dispose of this material.
- Sweep the roadway and parking lots after the large festival or event.
- Follow the Power Washing procedure for clean-up procedures, see "References" below.
- Follow the Spill Response procedures, see "References" below. Have spill kits available and ensure that vendors understand that it is prohibited to dump any pollutants into the storm sewer system.

Portable Toilet Service

- Portable toilets are required at most large outdoor festivals and events. All portable toilet waste is classified as "septage."

- Units should be removed as soon as the festival or event is completed so that they do not become a nuisance or vandalized.

Food and Beverage Vendor Waste

- Waste generated by food and beverage vendors is regulated by the Colorado Retail Food Rules and Regulations.

9) Specific Operating Requirements for:

- Parks and Open Space Maintenance

Expected Records / Outputs: None.

Pesticide and Herbicide Application

- Apply pesticide and herbicides in accordance with the manufactures instruction and applicable rules and regulations, including FIFRA, Colorado Department of Agriculture, and the City and County of Denver’s Pesticides Discharge Management Plan.

Equipment

- Clean and store equipment at approved areas only.

Waste from mowing, planting, weeding, raking, pruning and trash collection

- Wastes (trash) generated from these activities should be disposed of an acceptable waste receptacle.
- Wood materials can be disposed of at one of the following wood recycling containers:
 - Two containers located at Joint Use Cargo
 - One container located at 88th Ave near the sand shed

10) References

A. Phone Numbers

DEN Communications Center (for Spill Reporting)..... (303) 342-4200
 Kim Ohlson (DEN Environmental Services)..... (303) 342-2637
 DEN Environmental Services (Main Line)..... (303) 342-2730

B. Guidance Materials (list not limited to the following)

- MSDSs
- DEN Stormwater Management Plan (SWMP)
- DOT Labeling and Placarding Guidance
- SPCC Plan

C. Related Environmental Guidelines (list not limited to the following):

Note: The following list identifies procedures related to MS4 Operations and Maintenance Procedures but may not be all-inclusive. The following procedures are considered primary documents for purposes of compliance with the MS4 permit.

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- ES-301-1.02 Cleaning/Washing – Aircraft, Vehicles, and Equipment
- ES-301-1.07 Storage of Vehicles and Equipment Containing Chemicals
- ES-301-2.05 Cleaning/Washing – Indoor Industrial Surfaces
- ES-301-2.07 Maintenance of Pretreatment Devices
- ES-301-3.01 Construction
- ES-301-3.02 Planning and Design
- ES-301-4.01 Management of Pesticides and Herbicides
- ES-301-4.03 Cleaning/Washing – Outdoor Areas and Structures
- ES-301-4.06 Pavement Deicing
- ES-301-4.08 Inspection and Maintenance of MS4 Structural Controls
- ES-301-5.02 Spill Response
- ES-301-6.01 General Waste Management

D. Applicable Regulations (list not limited to the following)

- 40 CFR 117.3 Determination of Reportable Quantities for a Hazardous Substance
- 40 CFR 122-124 NPDES Regulations for Storm Water Discharges
- 40 CFR 260-262-273 Federal RCRA Regulations
- 40 CFR 150-189 Federal Insecticide, Fungicide and Rodenticide Act Regulations
- 6 CCR 1007-3, Part 261 State RCRA Regulations
- City and County of Denver Municipal Separate Storm Sewer System (MS4) Permit
- City and County of Denver Pesticide Discharge Management Plan
- CCoD Ordinances
- Denver Wastewater Management Division Rules and Regulations
- Metro Wastewater Reclamation District Rules and Regulations
- DEN Rules and Regulations
- City and County of Denver Mayor’s Executive Orders

E. Other Documents

- DEN Managers Bulletins
- CCoD Executive Orders