



# WET WEATHER MONITORING PROGRAM DESCRIPTION DOCUMENT

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*by*

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# EXECUTIVE SUMMARY

The Colorado Department of Transportation's (CDOT's) municipal separate storm sewer system (MS4) is permitted under the Colorado Discharge Permit System (CDPS). The permit—CDPS Permit No. COS000005, Individual Permit Renewal for Discharges (MS4 Permit)—requires CDOT to implement seven program areas to prevent pollutants from entering state waters [Colorado Department of Public Health and Environment, 2015]. The permit further requires CDOT to develop a Program Description Document (PDD) for each of the MS4 Program areas that details how CDOT administers and implements the program area to include specific items that must be provided. This PDD is specific to the Wet Weather Monitoring (WWM) Program.

This WWM PDD comprises a narrative description of WWM Program implementation to meet the MS4 Permit requirements and to help avoid contributing pollutants to Colorado's surface water. The PDD also includes a PDD index, which is a list of citations (including revision history), locations, and staff responsible for WWM documentation and transmittal within CDOT as well as externally to the Colorado Department of Public Health and Environment (CDPHE). The WWM PDD integrates the CDOT's Environmental Management System (EMS) elements and will be updated as necessary to reflect current conditions, practices, and design standards.

The WWM PDD is intended to provide flexibility in accommodating program-specific MS4 Permit requirements and other information to guide effective program implementation. This WWM PDD is not only meant to address CDOT MS4 Permit regulatory requirements but will be an important tool to identify and reduce pollutant discharges into surface waters.

The CDOT Hydrologic Resource and Ecological Design Group has developed the CDOT EMS for program efficiency and improved environmental compliance. Elements of the CDOT EMS has been integrated into this PDD for program consistency and continuity.

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# 1.0 INTRODUCTION AND PROJECT TIMELINE

The goal of the Colorado Department of Transportation's (CDOT's) Wet Weather Monitoring (WWM) Program is to understand the impact on water quality from CDOT roads, rights-of-way (ROWs), maintenance facilities, and Permanent Water Quality Control Measure Practices (CMPs) associated with stormwater discharges. CDOT staff, regulators, and other interested stakeholders need to have a thorough understanding of the types of data required, the location from where the data needs to be gathered, and the quality assurance and quality control (QA/QC) procedures necessary for this goal to be possible. This will ensure that the program not only complies with Colorado Discharge Permit System (CDPS) Permit No. COS000005, Individual Permit Renewal for Discharges (MS4 Permit) but also provides an understanding of the potential impacts of surface water that flows from roads and facilities operated and maintained by CDOT.

A wet weather monitoring program was first introduced in a technical memorandum under the original Phase 1 MS4 permit issued on January 15, 2001. This memorandum provided guidance on which goals were financially feasible and a proposed implementation schedule. These goals were listed in the report as the following five objectives:

- **Objective 1**—Estimate pollutant loading into state waters from CDOT outfalls
- **Objective 2**—Estimate water quality benefits from CMPs
- **Objective 3**—Assess potential water quality impacts from highway deicer usage
- **Objective 4**—Assess the impact of the herbicide and fertilizer program to receiving waters
- **Objective 5**—Conduct in-stream monitoring.

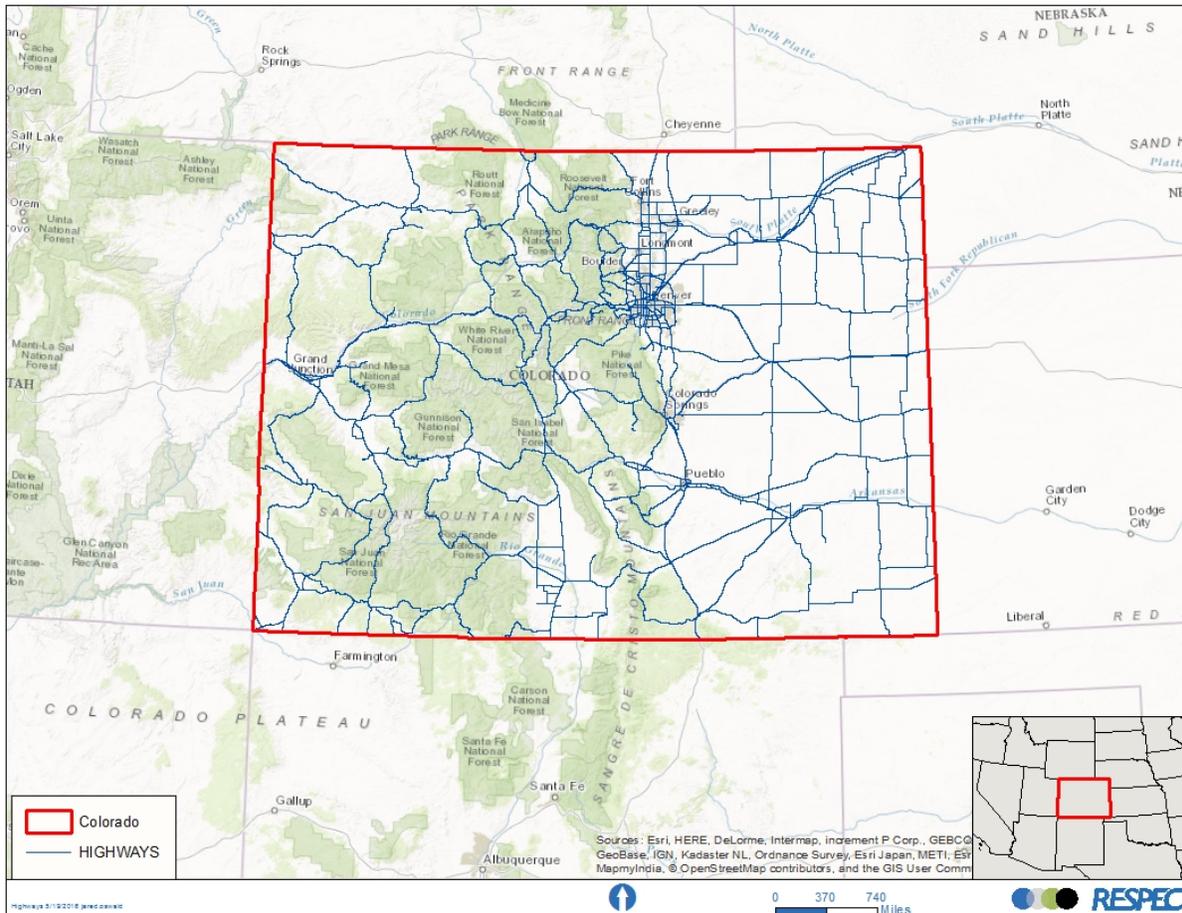
Objectives 1 and 2 were implemented by 2008, while Objectives 3 through 5 were not, with high costs being cited as the reason. Since that time, several roadways and facilities that are upstream and downstream of installed stormwater CMPs have been monitored for pollutants of concern.

Part I.F.6 of the CDOT's MS4 Permit defines several objectives, which include developing a WWM Program Description Document (PDD) that summarizes the process and procedures used to conduct the monitoring and analysis. The WWM PDD is intended to provide flexibility to accommodate program-specific MS4 Permit requirements and other information to effectively implement the program. The PDD is a tool for the CDOT Hydrologic Resources Unit, WWM MS4 Manager, CDOT regions, regulators, and other interested parties to understand how and why water quality data from the WWM Program is collected, stored, and evaluated for stormwater management.

The CDOT Environmental Management System (EMS or system) Implementation Plan has been developed to provide the CDOT Hydrological Resources and Ecological Design Units and the MS4 Program Managers with a road map to develop, document, and implement an EMS. The EMS will seek to manage activities within CDOT that are regulated under water quality regulations in an integrated fashion. This EMS includes the CDOT WWM Program that provides an important function in the overall CDOT MS4 Program. The EMS fosters continual improvement in water quality performance and consistency in implementing water quality requirements within CDOT as well as promotes improved permit and regulatory compliance. The structure and elements of the PDD are consistent with the CDOT EMS Program.

## 2.0 DECLINE STABILITY EVALUATION

The MS4 Permit covers areas of the Colorado state highway system and associated ROWs as well as all properties owned and operated by CDOT within the CDOT MS4 Permit Phase I and Phase II permit areas. Figure 2-1 shows the extent of the Colorado state highway system throughout the state. Currently over 23,000 lane miles of Colorado state highway system are currently covered by the CDOT MS4 Permit.

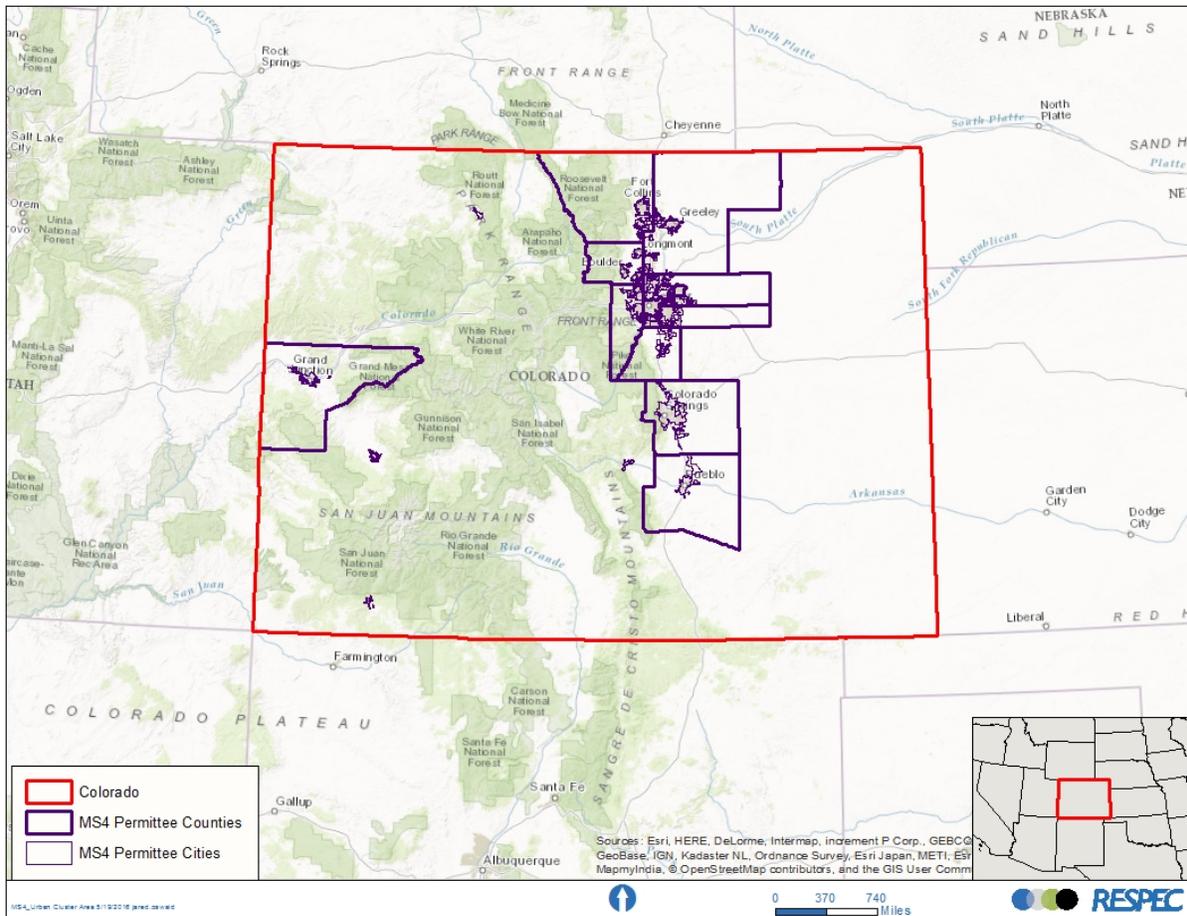


**Figure 2-1.** Colorado State Highways Covered by the MS4 Permit.

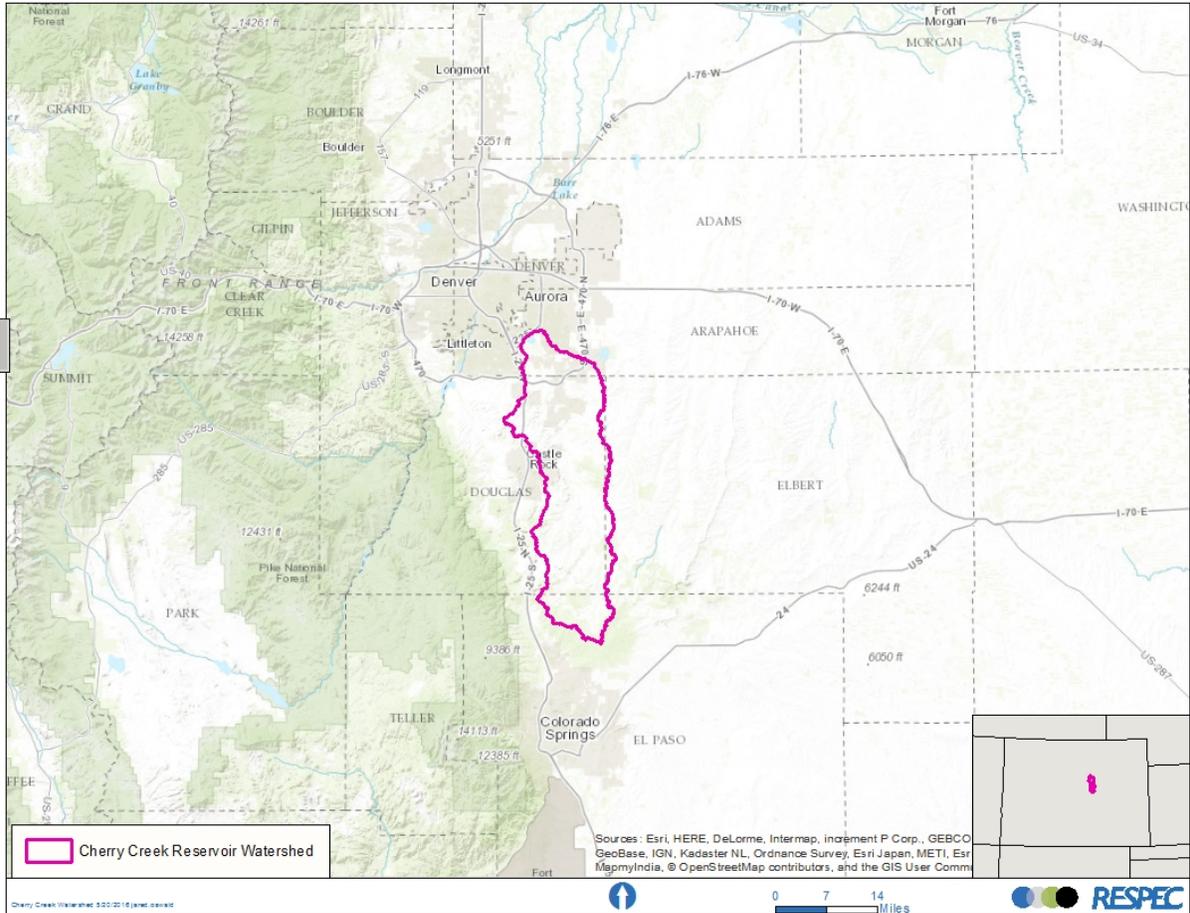
Properties owned and operated by CDOT in another permittee’s permit area are covered by the CDOT’s permit, which includes cities, counties, and specially designated areas. The permit lists several cities that meet the definition of “another permittee’s permit area.” The US Census Bureau [2010] designated that the CDOT’s MS4 Permit also includes urbanized areas in Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, El Paso, Jefferson, Larimer, Mesa, Pueblo (including Pueblo West Metro District), and Weld Counties. Figure 2-2 displays the cities and designated urbanized areas in the counties identified as permitted. The Cherry Creek Reservoir drainage basin, which is displayed in Figure 2-3, has been specially designated as an area within the CDOT’s MS4 Permit.

Figure 2-4 and Table 2-1 provide locations and details of facility locations that have historically been monitored by the CDOT WWM Program, while Figure 2-5 and Table 2-2 provide the same information for

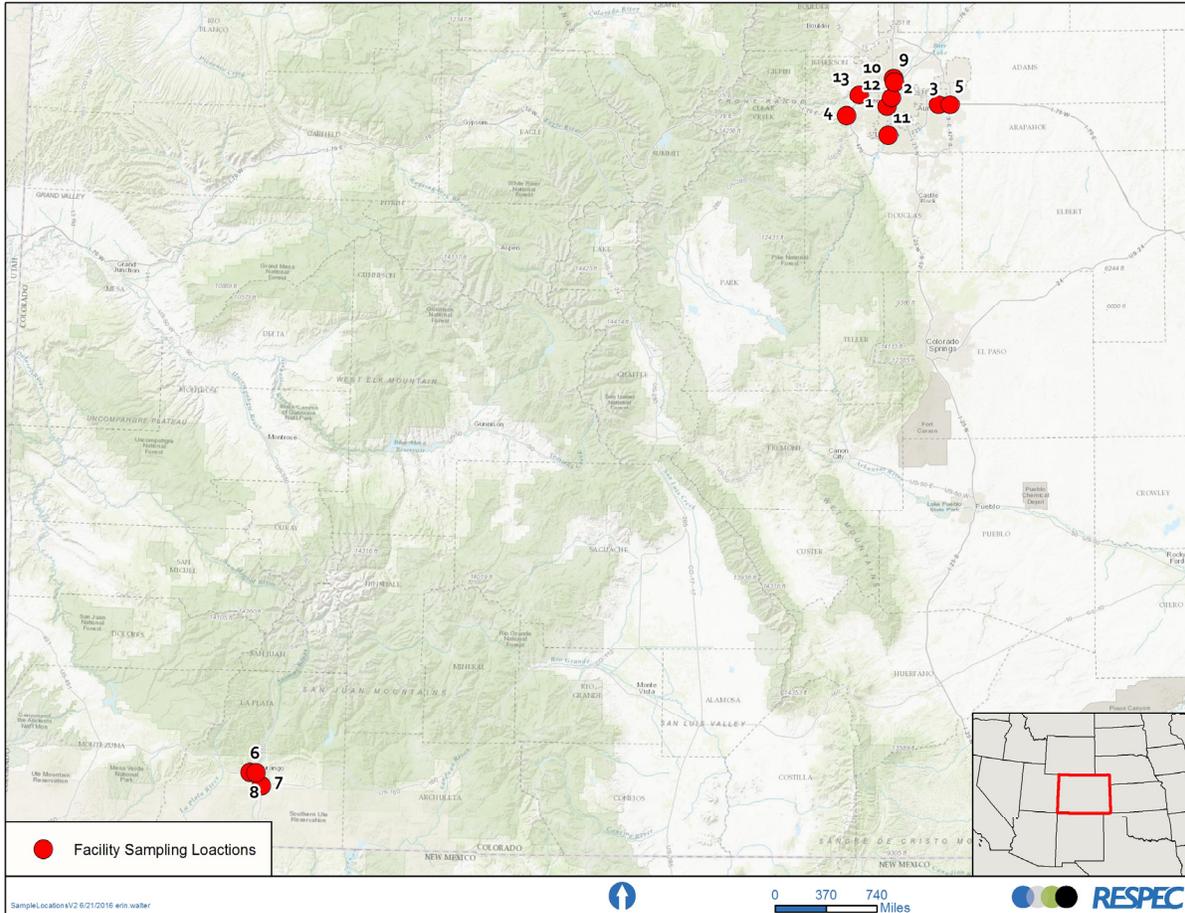
historically monitored highway locations. The site numbers identified in Figures 2-4 and 2-5 correlate to the site numbers in Tables 2-1 and 2-2, which provide a site name, sample years, and location information. Future WWM locations will need to be documented and mapped with GIS in a similar manner.



**Figure 2-2.** Cities and Designated Urbanized Areas Within Counties Listed in the Colorado Department of Transportation MS4 Permit.



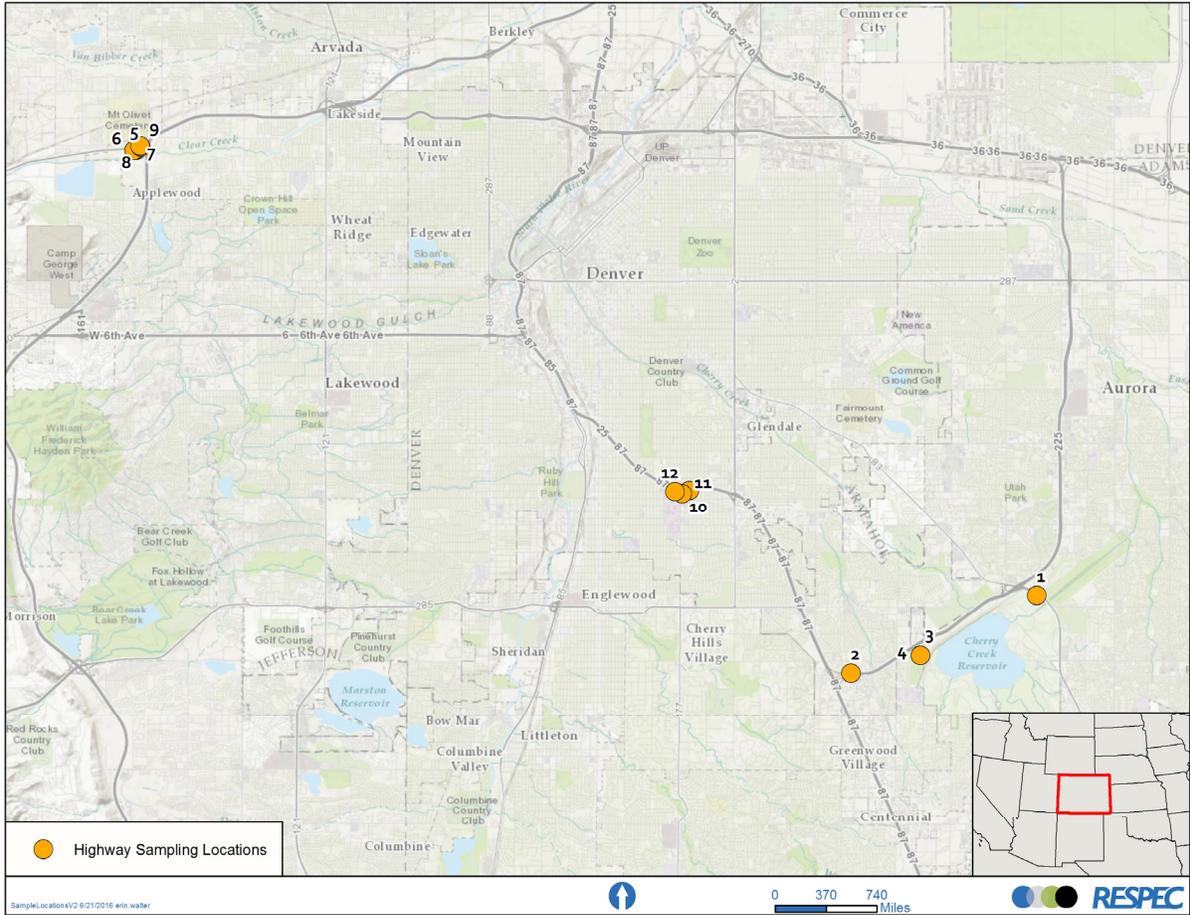
**Figure 2-3.** Location of Specially Designated Cherry Creek Reservoir Watershed Area.



**Figure 2-4.** Locations of Previously Sampled Facility Locations.

**Table 2-1. Previously Sampled Facility Locations**

I.D.	Site Name	Sample Years	Latitude	Longitude
1	11th Ave.	2010	39.734613	-105.014085
2	Park Ave.	2010	39.767299	-104.995436
3	R-1 Colfax Ave.	2010	39.73634	-104.774026
4	I-70WBP&R	2010	39.699225	-105.20556
5	E470&I-70	2010	39.736259	-104.716963
6	West US 160	2011	37.269941	-107.910044
7	East/South US 160	2011	37.22152	-107.858077
8	Snow Dump	2011	37.268104	-107.884413
9	*PT#6813 Outfall	2012 & 2013	39.835468	-104.983125
10	*PT#6813 Separator	2012 & 2013	39.837065	-104.983248
11	*PT#6822 Outfall	2012 & 2013	39.628812	-105.009762
12	*PT#6898 Outfall	2012 & 2013	39.823923	-104.980325
13	ZANG Outfall	2014	39.776013	-105.145537



**Figure 2-5.** Locations of Previously Sampled Highway Locations.

**Table 2-2. Previously Sampled Highway Locations**

<b>I.D.</b>	<b>Site Name</b>	<b>Sample Years</b>	<b>Latitude</b>	<b>Longitude</b>
1	Cherry Creek Permanent Water Quality Structure	2011	39.656	-104.837
2	RTD I-225 Ballast	2011 & 2012	39.635332	-104.90084
3	N-I-225&RTD Grassy Swale Drop Inlet	2011	39.660135	-104.840025
4	N-I-225&RTD Before Silt Berm #4	2011	39.660407	104.839483
5	Hwy 58 & I-70 SW-PWQS Outfall	2012	39.77487	-105.14694
6	Hwy 58 & I-70 SW-PWQS Inlet 1A	2012	39.774875	-105.14763
7	Hwy 58 & I-70 SW-PWQS Ditch	2012	39.774875	-105.14763
8	Detention Pond Inlet (ditch): ID# CO-058A-RS00010-EN002	2014	39.775717	-105.145318
9	Zang Facility Inlet to Pond: ID# CO-058A-RS00010-EN002	2014	39.776013	-105.145537
10	Detention Pond Wetland System Main Inlet: ID# CO-025A-RS00251-EN004	2014 & 2015	39.684167	-104.956389
11	Detention Pond Wetland System Outfall: ID# CO-025A-RS00251-EN004	2014 & 2015	39.683333	-104.958889
12	Detention Pond Wetland system Outfall: ID# CO-025A-RS00251-EN003	2015	39.683889	-104.961389

## 3.0 APPLICABLE PROJECTS

The MS4 Permit stipulates the type of areas that are considered applicable for monitoring stormwater discharges. Three areas exist that should be monitored: Complex highway-maintenance facilities, outfalls from priority development highway road surfaces with CMPs, and outfalls from priority development highway road surfaces without CMPs. The CDOT's MS4 Permit applies only to CDOT Phase I and Phase II MS4 Permit areas. The WWM Program may also perform special projects beyond permit requirements that will aid in understanding stormwater, improving water quality management, and facilitating collaboration among other agencies. WWM projects that include areas in another jurisdiction's ROW should coordinate with the Region's Water Pollution Control Manager or Water Quality Specialist (and with the jurisdiction as needed) to coordinate sampling logistics, access, and data sharing.

Complex highway-maintenance facilities are described in the MS4 Permit as having at least two attributes that include the following:

- Vehicle maintenance and washing facilities, and motor pools with vehicle maintenance and washing facilities
- Asphalt and concrete batch plants that are not subject to a separate Colorado Discharge Permit System or National Pollutant Discharge Elimination System (NPDES) permit coverage
- Solid-waste transfer stations where waste and recyclables are briefly held before further transport
- Outdoor storage yards with exposed stockpiles of materials, such as stockpiles of road deicing salt, sand, rotomill material, dirt, gravel, snow dumps, sweeper tailings, and/or spoils
- Equipment storage yards that contain signs, traffic lighting, and guard rails.

Priority development highway road surfaces with control measures are defined as those that discharge to an impaired 303(d)-listed stream or lake and have been designed by using the control measure, Water Quality Capture Volume (WQCV), pollutant removal, the previous permit design standard specified in Part I.E.2 of the permit, or drainage to a regional detention facility designed to its applicable WQCV standard.

Stormwater monitoring must provide an assessment of representative pollutant sources and characterize the overall expected loading from the facility. The list of pollutants of concern for roadways and maintenance facilities include the following:

- Total suspended solids (milligrams per liter [mg/L])
- Conductivity (deciSiemens per meter [dS/m])
- Hardness, total (as CaCO<sub>3</sub>) (mg/L)
- Arsenic, total recoverable (micrograms per liter [µg/L])
- Arsenic, potentially dissolved (µg/L)
- Cadmium, total recoverable (µg/L)
- Cadmium, potentially dissolved (µg/L)
- Chromium, total recoverable (µg/L)

- Chromium, potentially dissolved ( $\mu\text{g/L}$ )
- Copper, total recoverable ( $\mu\text{g/L}$ )
- Copper, potentially dissolved ( $\mu\text{g/L}$ )
- Magnesium, total recoverable ( $\mu\text{g/L}$ )
- Magnesium, potentially dissolved ( $\mu\text{g/L}$ )
- Manganese, total recoverable ( $\mu\text{g/L}$ )
- Manganese, potentially dissolved ( $\mu\text{g/L}$ )
- Selenium, total recoverable ( $\mu\text{g/L}$ )
- Selenium, potentially dissolved ( $\mu\text{g/L}$ )
- Zinc, total recoverable ( $\mu\text{g/L}$ )
- Zinc, potentially dissolved ( $\mu\text{g/L}$ )
- Total ammonia as nitrogen ( $\text{mg/L}$ )
- Phosphorous ( $\text{mg/L}$ )
- Chloride ( $\text{mg/L}$ )
- Sodium ( $\text{mg/L}$ )
- Oil and grease ( $\text{mg/L}$ ).

Other constituents can be added to this list that have the potential to be present and cause detrimental impacts to the beneficial uses of adjacent receiving waters.

## 4.0 PLANNING AND APPROVAL

Before the end of each calendar year, a planning session should be conducted that includes the WWM Manager; Hydrologic Resources Unit Manager; the Hydrologic Resources and Ecological Design Manager; and staff involved with sample collection, processing, and analysis. The session should involve a review of sites and data collected in previous years as well as reviewing the successes and challenges encountered. Part I.E.6.a.i of the MS4 Permit describes the minimum compliance requirements that need to be considered during site selection and includes the following:

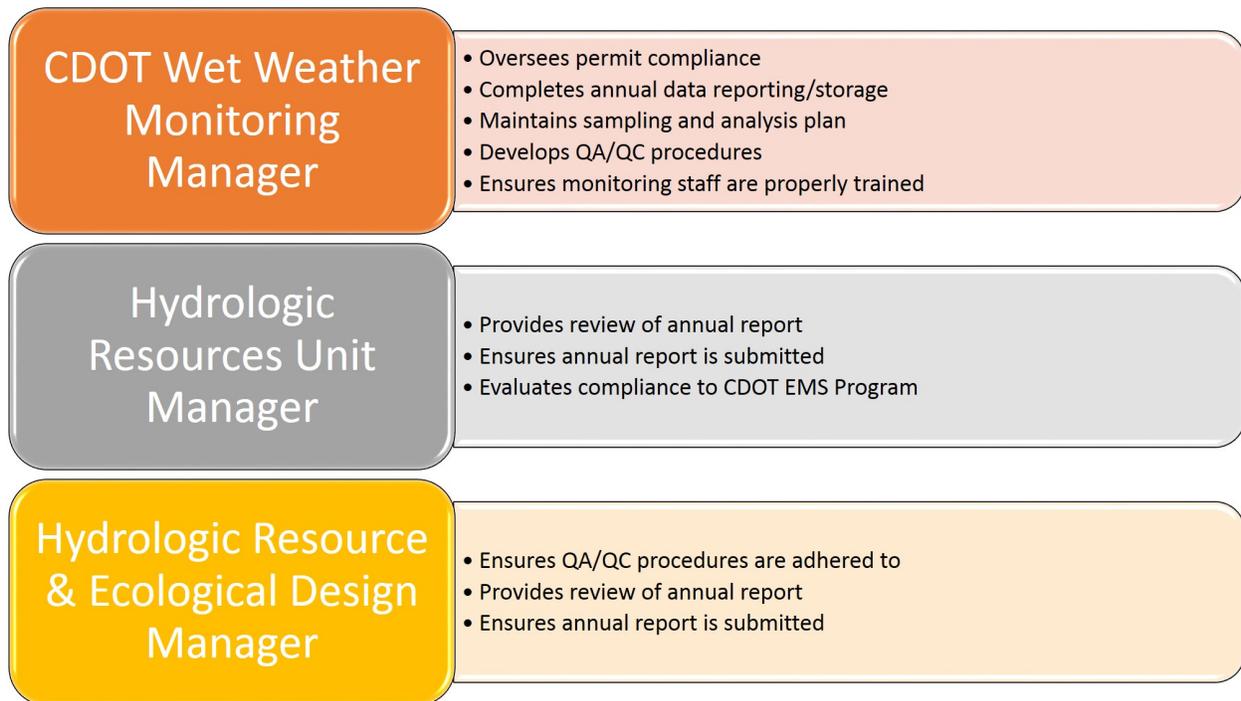
- Six outfall locations/sample points will be monitored each calendar year.
- Outfall locations should include at least one complex highway-maintenance facility, one priority development highway road surfaces with control measures, and one priority development highway road surfaces without control measures.
- Three samples will be collected from the monitored outfall location/sample points each calendar year.
- Each sample from roadways with or without a control measure will be monitored for all roadway pollutants of concern as well as for conductivity and hardness.
- Each sample from facilities will be analyzed for the respective pollutants of concern as well as other parameters that have the potential to impact the beneficial uses of receiving waters.
- All samples need to be taken from a measurable storm event, which is defined as:
  - An event that results in discharge from a site
  - A rain event that follows the preceding measurable storm event by at least 72 hours
  - A snow event where measurable discharge occurs as a result of melting snow.
- At least one rainfall event and one snowfall event should be collected each calendar year from a given site.

The following list of factors should be considered when prioritizing monitoring locations for roadways and maintenance facilities:

- Does the site drain to a 303(d) impaired stream or Cherry Creek Reservoir?
- Is the site near trained stormwater collection staff?
- Is the site easily accessible?
- Has the site been previously monitored?
- Does the site represent characteristics of discharge from a combination of highway-maintenance facilities or priority development highway road surfaces with and without control measures?
- Does the site reside in an existing MS4 Permit (specific to maintenance facilities only)?

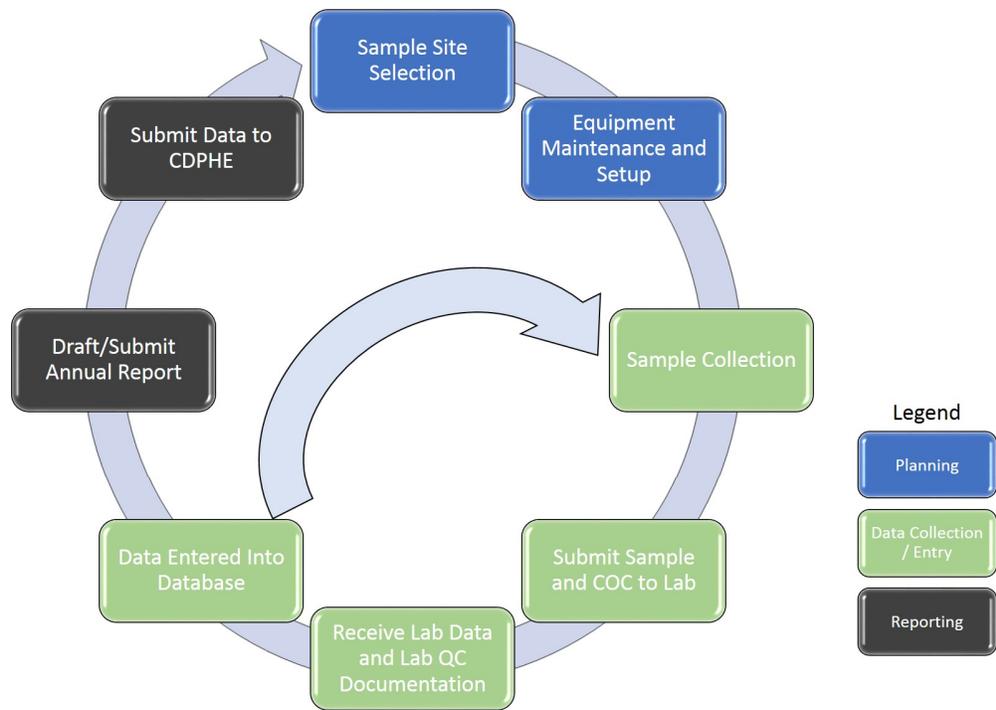
## 5.0 PROGRAM ORGANIZATIONAL STRUCTURE

The assigned responsibilities for each of the WWM Program leads is displayed in Figure 5-1. The WWM Manager oversees the day-to-day operations of the program and monitoring staff, while the Hydrologic Resources Unit Manager and Hydrologic Resource and Ecological Design (HRED) Manager are tasked with ensuring that reporting requirements and permit compliance are being followed.



**Figure 5-1.** Responsibility Matrix for Wet Weather Monitoring Program Leads.

The annual workflow for the WWM Program is displayed in Figure 5-2. The workflow contains three phases: planning, data collection/entry, and reporting. The data collection/entry phase will be a redundant loop until all of the required samples have been collected in a given year to meet permit requirements.



**Figure 5-2.** Annual Workflow for the Wet Weather Monitoring Program.

## 6.0 REGULATORY STRUCTURE AND STANDARD OPERATING PROCEDURES

Legal requirements that will be managed within the CDOT WWM Program are based on the Clean Water Act, which provides the overarching regulatory framework for this program. The majority of these CDOT legal requirements are tied to Colorado discharge regulations associated with state enforcement of the Clean Water Act, since the Colorado Department of Public Health and Environment (CDPHE) has been given regulatory enforcement responsibilities by the US Environmental Protection Agency (EPA). The CDOT MS4 Permit issued by the CDPHE further defines specific legal requirements with which CDOT must comply. Agreements with coregulating MS4 Permits, such as with other MS4 Permit municipalities, will also be included as regulatory requirements in the EMS. Additionally, local regulatory requirements and permits from counties, municipalities, and other MS4 Permit holders that apply to CDOT operations will be included.

The CDOT WWM Program is responsible for installing, calibrating, using, and maintaining all of the monitoring methods and equipment. The sampling needs to be conducted in accordance with the specified methods in Title 40 of the Code of Federal Regulations Part 136 (40 C.F.R Part 136) [US Government Publishing Office, 2016], methods approved by the EPA pursuant to 40 C.F.R Part 136, or methods approved by the CDPHE Water Quality Control Division in the absence of a method specified in or approved pursuant to 40 C.F.R., Part 136.

For roadway features with and without control measures as well as facilities, a composite sample of all pollutants of concern must be collected during both rain and snow events. The lone exception to this rule is oil and grease, which can be collected as a grab sample and do not require compositing. Additionally, the maximum flow that occurred during the 24-hour period surrounding sample collection must be recorded.

A more challenging aspect of the stormwater-monitoring requirements is collecting flow-weighted composite samples for a majority of the pollutants. As identified in the WWM Sampling and Analysis Plan (SAP), this monitoring will require either installing a direct-flow measurement device, such as a flume or weir, at the sampling point or developing a stage-discharge relationship. Depending on site conditions and anticipated flows, installing a direct-flow measurement device may be the most cost-effective means of developing a composite sample. However, if conditions are not conducive to installing a direct-flow measurement device, a stage-discharge relationship is developed for the monitoring site. This involves measuring discharge from the sampling point by using methods such as an area-velocity meter over a wide range of flows during storm events. Specific standard operating procedures and analytical testing for stormwater collection and analysis is detailed in the CDOT WWM SAP and the CDOT Quality Assurance Project Plan (QAPP).

The permit defines the practical quantitation limit (PQL) for each pollutant of concern as “the minimum concentration... that can be measured with a high degree of confidence that the pollutant of a concern is present at or above that concentration.” The permit directs that the minimum concentration being

analyzed should be the PQL. The only exception is when the lowest surface water or groundwater quality standard is greater than the PQL; the minimum concentration being analyzed can then be the lowest surface water or groundwater quality standard.

## 7.0 TRAINING AND CERTIFICATIONS

CDOT has an existing employee qualification/competency process as part of the hiring, reviewing, and promoting process. Job descriptions and performance evaluations document employee competencies. The existing CDOT qualification process will be relied on to demonstrate employee competencies. CDOT management will review existing qualifications and competencies to identify any gaps in job descriptions and individual performance objectives. The samplers' qualifications and training will include but not be limited to stormwater field experience, field measurements, automatic-sampler operation, sample handling, and data interpretation.

The CDOT WWM Program has a comprehensive, consistent training approach that ensures training is identified, performed, and evaluated for effectiveness. The WWM Program Manager has identified all water quality training requirements for CDOT employees and others, such as contractors or university students, who may perform work on behalf of the CDOT. This includes all necessary training to ensure water quality is properly sampled, delivered to the laboratory, entered into the database, and analyzed. Consistent with the CDOT EMS, identified training includes the following:

- Subject or title of training
- Responsibility for training-course development and maintenance; CDOT will use a collaborative approach that includes the CDOT WWM Manager, Hydrologic Resources Unit Manager, HRED Manager, and other CDOT personnel, in addition to possible consultant assistance, as necessary
- Responsibility for curriculum approval
- Location where the curriculum will be maintained
- Frequency of curriculum review
- Frequency of training
- Optional attendees.

The WWM Program Manager works with the HRED Manager and Training Leader to establish how completing training will be tracked.

The effectiveness of training will also be assessed; methodologies to confirm that training is effective can include testing, observing, auditing, and completing performance measures. The WWM Program Manager will establish methods to confirm training effectiveness. The methods will depend on the specific characteristics of the training and its purpose. The Program Managers will review training and its effectiveness annually and will identify any changes that need to be implemented.

## 8.0 PROGRAM COMPLIANCE AND QUALITY ASSURANCE

An overall WWM Program Quality Assurance Plan will be developed to include specific field and laboratory quality control actions as part of the SAP and a QAPP. This plan will be incorporated by referencing this PDD for future use. WWM Program identification of EMS performance metrics will be detailed in this section. This section also describes MS4 Program QA/QC actions that are relevant to the WWM Program. A WWM programmatic QA/QC will be identified under conditions where CDOT internal and external subcontractor support is used in collecting stormwater-related data for the CDOT.

The WWM SAP is critical in both a QA/QC and regulatory context. The SAP documents the procedural and analytical requirements for projects that involve collecting water, soil, sediment, or other samples taken to characterize areas of potential environmental contamination. The SAP combines the basic elements of a QAPP and a Field Sampling Plan. The SAP contains the permit requirements necessary for CDOT to comply with its MS4 Permit.

### 8.1 SAMPLING AND ANALYSIS PLAN

The CDOT WWM SAP meets the requirements for the EPA and CDPHE that involve collecting stormwater measurements. According to EPA guidance and protocols, the CDOT WWM SAP contains the following Tier I general information that will ensure stormwater data quality:

- Introduction
  - Project site description
  - Project background
  - Compliance monitoring
  - Sampling approach
  - Interim goals
- Field sampling plan
  - Sampling objectives
  - Sampling locations
  - Stormwater sampling
  - Sampling frequency
  - Sampling device
  - Sample collection methods
  - Sample labeling and handling
  - Laboratory analyses
  - Equipment decontamination
- Quality assurance project plan
  - Quality assurance objectives
  - Measurement quality objectives
  - Data generation and acquisition
  - Assessment and oversight
  - Data validation and usability

- Data analysis
- Data reporting
- References.

The CDOT WWM SAP, located on CDOT's website ([www.codot.gov](http://www.codot.gov)), is reviewed annually to ensure new regulations, requirements, or internal sampling locations and protocols are addressed and incorporated.

## 8.2 ENVIRONMENTAL MANAGEMENT SYSTEM PERFORMANCE METRICS

The CDOT WWM Program is important in identifying CDOT roadway and maintenance pollutants that enter state waters as well as the need to institute control measures. The CDOT WWM Program is also important in identifying potential pollutant mass loadings into sensitive total daily maximum load areas. Consistent with the CDOT EMS Program, the following performance metrics are used to assess success and to evaluate the need for adaptive management:

- Meeting or exceeding the collection of stormwater events as required in the permit
- Identifying new pollutants or higher loading rates than anticipated
- Installing and designing Permanent Water Quality (PWQ) control measures based on stormwater data
- Identifying changes in PWQ-control designs, placement, or management based on stormwater data
- Maintaining a level of positive feedback from CDOT management on annual report findings and recommendations.

## 8.3 COLORADO DEPARTMENT OF TRANSPORTATION WET WEATHER MONITORING QUALITY ASSURANCE/QUALITY CONTROL

The WWM SAP provides important QA/QC aspects and elements in data collection and the analysis of stormwater. The CDOT WWM has programmatic QA and control elements that are consistent with the overall HRED QA/PDD. The HRED QA/PDD is based on the CDOT EMS Program. These quality elements are consistent with the CDOT EMS Program. The following CDOT quality control elements are used to assess program compliance:

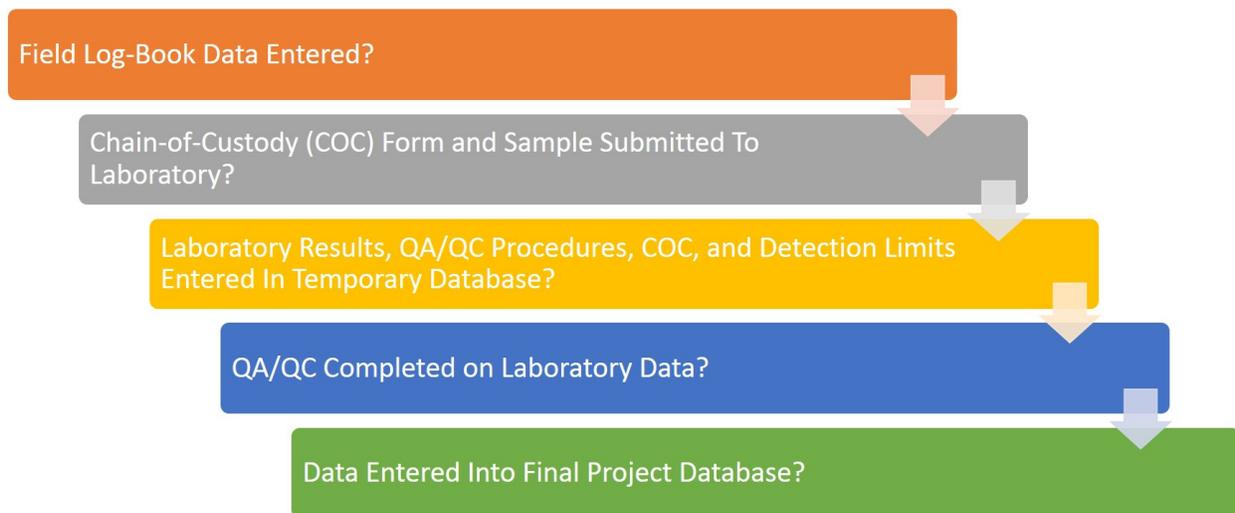
- The WWM Program will be reviewed and revised for new regulatory requirements based on adaptive management.
- Independent HRED or third parties will audit the WWM Program every 2 years to ensure compliance to the MS4 Permit and the SAP.
- Audit findings will be in the following categories:
  - Conformance with the EMS requirements
  - Opportunities for improvement (OFIs)—no nonconformance exists, but sufficient evidence exists to be concerned that nonconformance may occur
  - Nonconformance are outcomes that are inconsistent with EMS requirements.
- Auditing protocols and process are identified in the HRED PDD.

- Noncompliance findings from audits will be handled through Corrective and Preventive Action and presented at Management Review.
- According to the CDOT EMS, the corrective action process ensures that nonconformance in the MS4 Permit Program is systematically addressed and tracked through closure.
- Laboratory audits may be necessary if corrective actions are identified based on poor-quality data.
- Annual reports will be provided by the CDOT WWM Manager to the CDOT HRED management.

## 9.0 TRACKING

A process checklist, which is provided in Figure 9-1 and included in the WWM SAP, has been developed to track and ensure that proper procedures have been followed for each stormwater sample—from collection to data entry. The process of sample tracking begins when field log-book data are entered into an Excel spreadsheet that contains entries for the following items:

- Site identification and description
- Sample collector's name
- Site latitude and longitude and associated GPS documentation data
- Start/sample/end times
- How and where the sample was collected (e.g., off bridge with bucket, left/right streambank—determined while facing *upstream*)
- Field measurements
- Sampling methods (e.g., flow measurement equipment/methodology, grab sample, or composite)
- Observations and comments, and summary of QA activity (if any).



**Figure 9-1.** Checklist for Sample Collection and Data Tracking.

Once the sample has been collected, a Chain of Custody (COC) form needs to be generated and submitted with the sample. The COC form along with laboratory data results, which include laboratory QC procedures and detection limits, will then be entered into a temporary project database. This temporary database is used to store interim data that have not gone through rigorous QC procedures. After QC by the WWM Program Manager, the data are then transferred to the final project database.

## 10.0 DOCUMENTS AND RECORD KEEPING

Several forms and templates must be completed by CDOT field professionals, contractors, or students who are involved in the sample collection, sample processing, data input, sample analysis, and reporting. All the forms and templates are located in the final project database within the “Forms and Templates” folder. Once completed, the forms and templates are stored by the year they were completed in the final project database. The form name along with specific information about the phase it was completed in, format, individual(s) responsible for populating, and individual(s) responsible for QA/QC are displayed in Table 10-1.

Part I.F.6 of the CDOT MS4 Permit establishes that the following records are required to be maintained for each sample collected:

- The date, type, exact location, and time of sampling or measurements
- Type of location being monitored (facility or roadway)
- Location information (i.e., CMP outfall or CMP inlet)
- The individual(s) who performed the sampling or measurements
- The date(s) the analyses was performed
- The individual(s) or entity who performed the analyses
- The analytical techniques or methods used
- The results of such analyses.

Additionally, the WWM Program maintains all COC forms for water quality samples, original strip chart recordings or digitally logged flow data, and equipment calibration/maintenance records within the final project database. Part I.K.2 of the CDOT MS4 Permit states that these data and any reports generated from it must be retained “for a period of at least 3 years from the date that the specific item is no longer being actively used for stormwater management.” This period of retention also needs to be extended in the case of any unresolved litigation pertaining to the discharge of pollutants by the permittee or when directly requested by CDPHE or the EPA. To ensure this requirement is met, all of the data generated are uploaded into the Colorado Data Sharing Network. The monitoring results and other contents within the final project database must be discussed at least annually with HRED representatives to potentially improve water quality management practices.

**Table 10-1. Forms and Templates**

<b>Template</b>	<b>Project Phase</b>	<b>Format</b>	<b>Individual Responsible for Populating</b>	<b>Individual Responsible for QA/QC</b>
Chain of Custody	Sample Collection	PDF	Field Staff, Subcontractor, and Student	WWM Program Manager
Field Log Book	Sample Collection	MS Word, MS Excel, and PDF	Field Staff, Subcontractor, and Student	WWM Program Manager
Flow Records	Sample Collection	MS Word, MS Excel, and PDF	Field Staff, Subcontractor, and Student	WWM Program Manager
Equipment Calibration/Maintenance Records	Sample Collection	MS Word, MS Excel, and PDF	Field Staff, Subcontractor, and Student	WWM Program Manager
Laboratory Results	Sample Processing	MS Word, MS Excel, and PDF	Laboratory	WWM Program Manager
Summarized Laboratory Results	Sample Analysis	MS Word, MS Excel, and PDF	WWM Program Manager	Hydrologic Resource Unit Manager
Final Report	Final Deliverable	MS Word	WWM Program Manager	Hydrologic Resource Unit Manager/HRED Manager

## 11.0 ANNUAL REPORTING

Part I.I.1 of the CDOT MS4 Permit outlines the annual system-wide reporting requirements that need to be submitted annually by CDOT by April 1. The report covers activities from January 1 to December 31 of the previous year. The WWM Program will be responsible for helping to develop several portions of the final report outlined below:

- Part I.I.1.d provides a list of compliance schedule items that need to be completed, which include the completion date and any associated information required in Part I.H.
- Part I.H specifies that the WWM Program is required to ensure permit requirements are being met and that implementation and documentation procedures are being revised as necessary. This needs to be completed by March 1, 2017, with results included in the April 1, 2018, annual report.
- Part I.I.1.e provides the assessment results of the control-measure effectiveness.
- Part I.I.1.f specifies the results of the permit-modification assessment and whether or not any part of this permit needs to be modified or if a condition of the permit may not be practicable.

Specifically, reporting on Part I.I.1.e will require the WWM Program to follow protocols and QA/QC procedures outlined in this PDD to ensure compliance with the permit. All information necessary to complete this reporting requirement should be readily accessible from the final project database in a folder labeled for the respective year that the monitoring was completed.

If extenuating circumstances, such as budget, availability of trained staff, or weather anomalies, prevent the WWM Program from completing its permit responsibilities, the reasons will be thoroughly documented in the final annual report. Additionally, WWM Program staff will coordinate directly with the CDPHE and identify any measures that could help alleviate future challenges.

Each year, the WWM Program team members should review the requirements of the permit and provide recommendations on whether or not modifications should be considered, as specified in Part I.I.1.f of the reporting requirements. This could include any suggested modifications to specified locations, frequency of monitoring, or pollutants being monitored.

In addition to the regulatory requirements, a WWM Annual Report is developed by the WWM Program Manager to the HRED Manager. This annual report will summarize the findings and recommendations based on stormwater quality concentration, loadings, pollutant-removal percentages, concentration trends, and pollutant identifications based on SAP sampling objectives, among other details. The annual report will evaluate and discuss whether or not success factors have been met and what (if any) corrective actions are necessary. The annual report is distributed to interested CDOT regions for reference and potential action.

## 12.0 PROGRAM DESCRIPTION DOCUMENT INDEX

The PDD index is a complete list of template documents, materials, databases, and guidance documents used to manage and implement the WWM Program. Each indexed resource identified in Table 12-1 includes the version year/year the information was retrieved, and the document's location. The WWM Program Manager will be responsible for annually reviewing the information included in the PDD index and updating the index as necessary.

**Table 12-1. Index of Pertinent Documents, Materials, Databases, and References Specific to the Wet Weather Monitoring Program**

Category and Item Description	Version Year/Year Retrieved	Location
Template Documents		
Chain of Custody	2016	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Field Log Book	2016	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Flow Records	2016	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Equipment Calibration/Maintenance Records	2016	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Laboratory Results	2016	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Summarized Laboratory Results	2016	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Final Report	2016	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Materials		
ISCO and Sigma Automatic Samplers	N/A	4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Tipping Buckets/Rain Gages	N/A	4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Flow Measurement Equipment	N/A	4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Sampling Kits	N/A	4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Equipment Housings	N/A	4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Miscellaneous Materials	N/A	4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Databases		
Temporary and Final Database	N/A	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
GIS Geodatabase	N/A	Final Project Database, HRED Department, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
Standard Operating Procedures and Guidance Documents		
WWM Sampling and Analysis Plan	2016	Final Project Database, 4201 E. Arkansas Ave., Shumate Bldg., Denver, CO 80222
CDOT MS4 Permit	2015	<a href="https://www.codot.gov/programs/environmental/water-quality/documents/cdot-ms4-permit">https://www.codot.gov/programs/environmental/water-quality/documents/cdot-ms4-permit</a>
Title 40 of the Code of Federal Regulations Part 136	2016	<a href="http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr136_main_02.tpl">http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr136_main_02.tpl</a>
USGS—How Stream Flow is Measured	2016	<a href="http://water.usgs.gov/edu/streamflow2.html">http://water.usgs.gov/edu/streamflow2.html</a>
SOP for the Planning of and Field Procedures for Conducting Monitoring Activity	2010	<a href="https://www.colorado.gov/pacific/sites/default/files/WQ_nonpoint_source-SOP-Water-Quality-Monitoring-Activities-030110.pdf">https://www.colorado.gov/pacific/sites/default/files/WQ_nonpoint_source-SOP-Water-Quality-Monitoring-Activities-030110.pdf</a>
SAP Guidance and Template Version 4	2014	<a href="https://www.epa.gov/sites/production/files/2015-06/documents/sap-general.pdf">https://www.epa.gov/sites/production/files/2015-06/documents/sap-general.pdf</a>

## 13.0 REFERENCES

**Colorado Department of Public Health and Environment, 2015.** "Authorization to Discharge Under the Colorado Discharge Permit System, Permit Number COS000005" *codot.gov*, retrieved June 22, 2016, from <https://www.codot.gov/programs/environmental/water-quality/documents/cdot-ms4-permit>

**US Census Bureau, 2010.** "2010 Census Urban and Rural Classification and Urban Area Criteria," *census.gov*, retrieved June 22, 2016, from <https://www.census.gov/geo/reference/ua/urban-rural-2010.html>

**US Government Publishing Office, 2016.** "Electronic Code of Federal Regulations," *ecfr.gov*, retrieved June 22, 2016, from [http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr136\\_main\\_02.tpl](http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title40/40cfr136_main_02.tpl)