



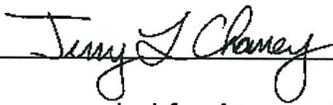
# **Stormwater Management Program (SWMP) Plan**

**Prepared by:  
Utah Department of Transportation**

**December 2016**

# Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

  
\_\_\_\_\_ Dec. 1, 2016  
Recommended for Approval Date  
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# 1 Stormwater Management Program

## 1.1 Introduction

This Stormwater Management Program (SWMP) was prepared by the Utah Department of Transportation (UDOT) to describe procedures and practices to reduce or eliminate the discharge of pollutants to Waters of the State to the maximum extent practicable (MEP).

This SWMP was prepared in accordance with UDOT's Municipal Separate Storm Sewer System (MS4) Permit No. UTS000003 to help achieve the goals outlined in the Code of Federal Regulations (CRF) Title 40 part 122, Federal Clean Water Act Section 402 and Utah Administrative Code R317-8.

## 1.2 Description

Control measures and BMPs described in this SWMP are designed to limit the discharge of pollutants to UDOT's MS4; which includes all roadway drainage systems, maintenance facilities and associated right-of-ways within UDOT's jurisdiction statewide.

### Minimum Control Measures

The SWMP addresses the six minimum control measures established by the EPA through the State Division of Water Quality. A separate section is dedicated to each control measure listed below, outlining BMPs that describe specific activities, procedures, training and other actions that help to prevent and reduce pollution to waters of the state.

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination (IDDE)
- Construction Site Stormwater Runoff Control
- Post-Construction Stormwater Management in New Development and Redevelopment
- Pollution Prevention/Good Housekeeping for Municipal Operations

### Additional Measures

- Industrial and High Risk Runoff
- Wet Weather Monitoring

## 1.3 SWMP Responsibility and Resources

The SWMP affects all UDOT Regions and most divisions; however, the level of impact and responsibility varies. Since stormwater protection is related to environmental and design, the Central Project Development Group undertakes stewardship and management responsibilities for the stormwater program. However, all Regions and several Central divisions have dedicated staff implementing the program described in this SWMP.

### 1.3.1 Oversight and Compliance

UDOT's organizational structure helps to ensure that the MS4 Permit requirements and the SWMP activities are implemented consistently statewide. Region management positions are responsible for day-to-day overall operations, whereas functional program managers oversee specific program areas. The SWMP is unique in that it must adapt to changes in technology, regulations, and requirements, and it operationally relies on UDOT staff oversight, inspection and enforcement to ensure Permit compliance.

Figure 1-1 shows the map of the UDOT Regions and Figure 1-2 and Figure 1-3 illustrates the UDOT Organizational chart and UDOT leadership staff with stormwater program responsibilities.

### 1.3.2 Stormwater Coordination

Figure 1-4 shows how various UDOT divisions and groups collaborate and manage the statewide stormwater program. The Project Development Group at the UDOT Central Office provides project support and assistance to Regions. Regions are responsible for design, construction and maintenance of individual projects. Staff from the Central Project Development Group coordinate the MS4 stormwater program and communicate with the Region Stormwater Coordinator and other groups including environmental, hydraulics, design, construction and maintenance on stormwater issues.

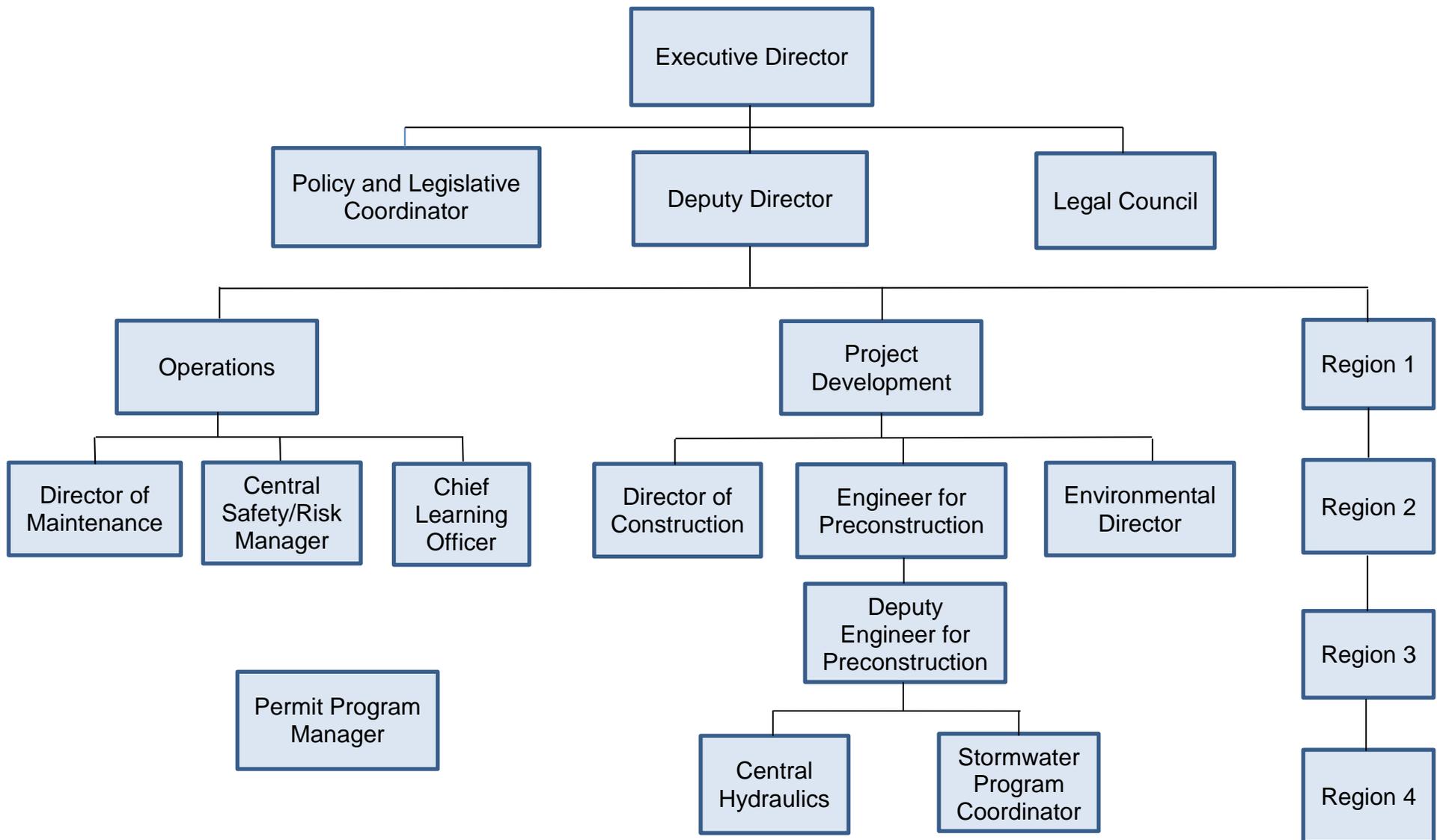
Each group and division is responsible for the following stormwater tasks according to their core activities:

- Developing tools (e.g., specifications, inspection forms, estimating methods, etc.) for incorporating stormwater requirements into activities.
- Developing manuals of instruction for using stormwater tools and educating staff and contractors on stormwater responsibilities, requirements, and activities.
- Developing and conduct training classes in support of manuals developed for stormwater quality.
- Assist Regions and other divisions and groups on stormwater issues.



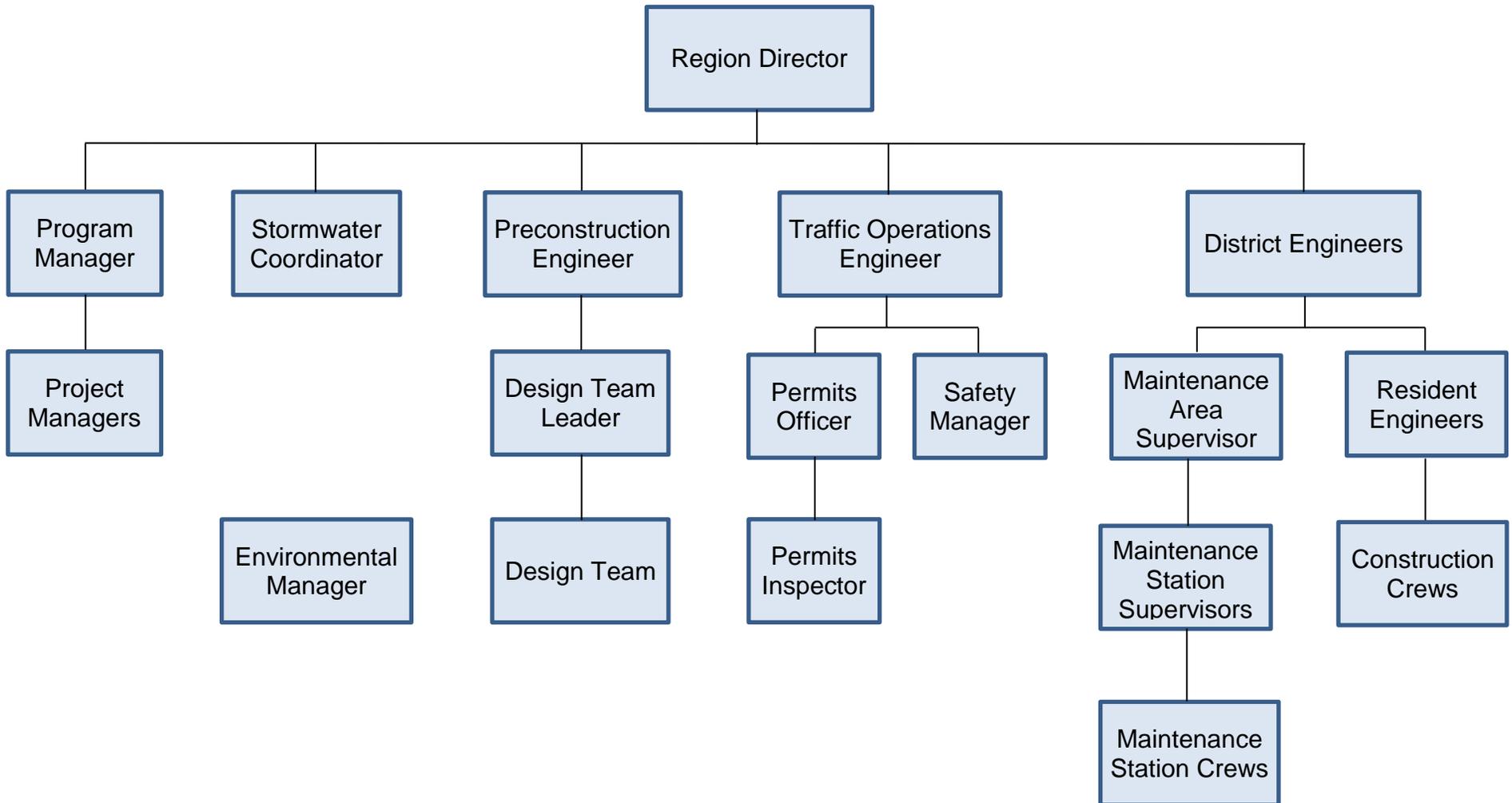
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Figure 1-2: Central Positions and Groups with Stormwater Program Responsibilities

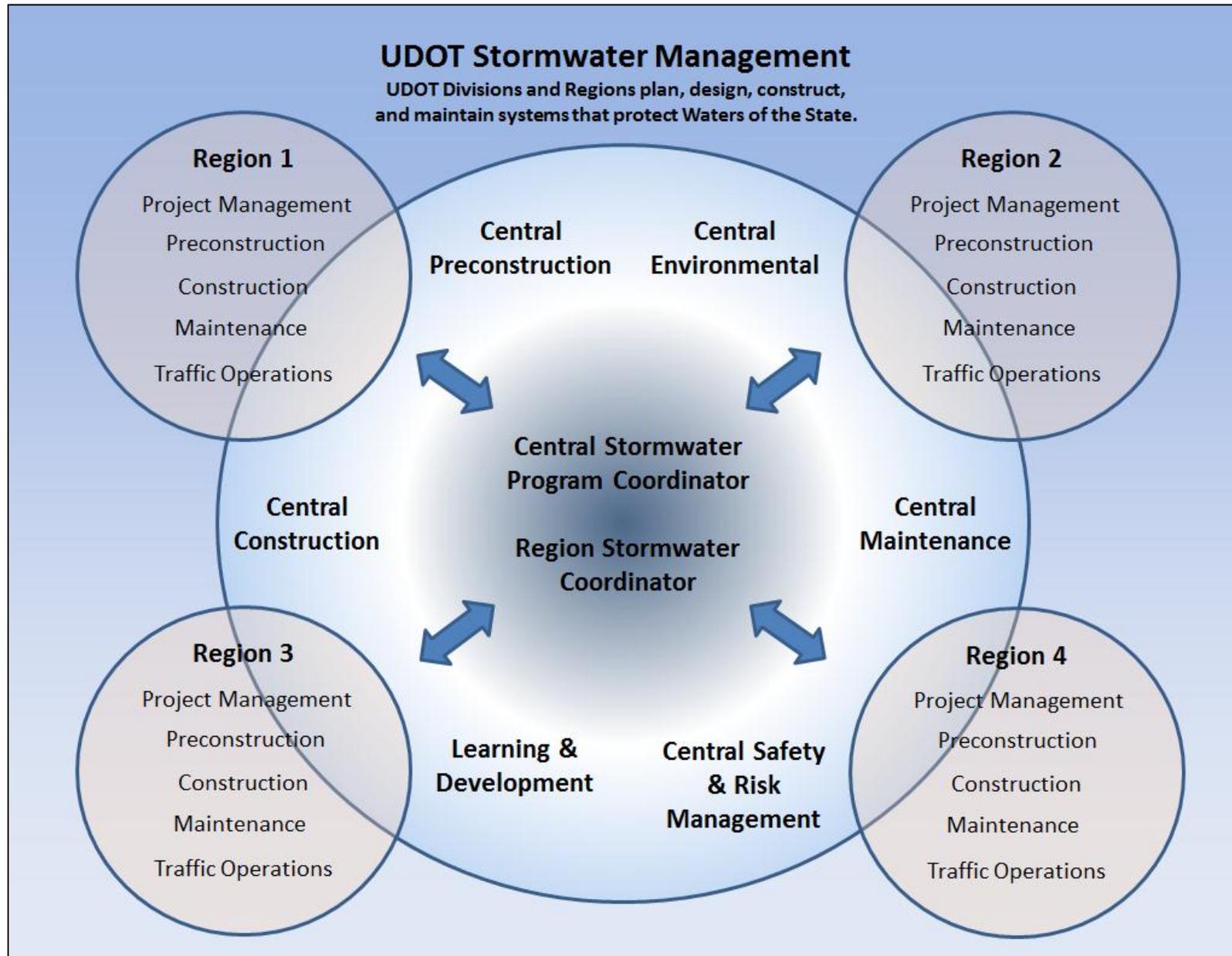


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Figure 1-3: Region Positions with Stormwater Program Roles and Responsibilities



**Figure 1-4: UDOT Stormwater Management Organizational Diagram**



### 1.3.3 SWMP Implementation – Role of Stormwater Program Coordinator

The UDOT Stormwater Program Coordinator provides statewide guidance on MS4 Permit compliance, regulatory coordination, SWMP revisions, BMP evaluation, Region coordination, stormwater monitoring, program evaluation and training.

The roles of the Stormwater Program Coordinator include:

- **Permit Compliance Oversight:** Ensure consistent SWMP implementation, and MS4 Permit compliance by UDOT Regions and UDOT groups and divisions
- **Regulatory Coordination:** Coordinate overall Permit compliance with UDEQ/DWQ and assists the Regions in coordinating specific stormwater compliance matters with UDEQ.
- **Updating the SWMP:** Coordinate revisions and annual up-dates to the SWMP in accordance with the MS4 Permit.
- **Evaluation of Treatment BMPs:** Coordinate the evaluation of the Treatment BMPs considered or identified for inclusion in the SWMP to manage the quality of discharges from stormwater drainage systems associated with UDOT's facilities. The process for evaluation and approval of BMPs is discussed in more detail in Section 7. The SWMP staff also oversees the evaluation of new stormwater quality management techniques, products and designs.
- **Coordination with UDOT Regions, Groups and Divisions:** Provide guidance and direction regarding MS4 Permit compliance. This includes providing training on Permit requirements, SWMP implementation, stormwater BMPs, compliance schedules, reporting formats, legal authorities, budgeting assistance and other information needed to effectively implement the MS4 Permit and SWMP requirements.
- **Monitoring & Screening:** Manage wet weather monitoring and provide assistance to Regions for dry weather screening to comply with the Permit requirements.
- **Program Evaluation:** Evaluate the stormwater program elements for Permit compliance and develop program improvements the assessment of effectively implementing the SWMP, through managing program evaluation tasks, including the management and implementation of activities for measuring the level of compliance.
- **Reporting:** Coordinate the preparation of the Annual Report and submit the report to DWQ.
- **Training:** Provide and recommend the necessary training for current and new employees on MS4 Permit compliance.

- **Public Education and Outreach:** Manage the public education and outreach efforts for improving stormwater quality.
- **Stormwater Resources:** Ensure adequacy of stormwater resources for each fiscal year; assist with prioritizing and evaluating stormwater resources, activities, and operations.

#### 1.3.4 SWMP Implementation – Role of Region Stormwater Coordinator

- **Region Stormwater Coordinators** - Manage stormwater permitting and compliance throughout their respective Regions. Stormwater Coordinators work with Region design, construction, maintenance and permitting staff to ensure compliance with UDOT's MS4 Permit.

#### 1.3.5 SWMP Implementation – Role of Preconstruction Division

The role of the Preconstruction Division includes providing direction to the Region Preconstruction staff on the implementation of water quality management practices associated with design activities. Key UDOT Preconstruction Division positions and responsibilities include:

- **Engineer for Preconstruction** - Responsible for the overall design program, policies, and procedures on a statewide basis.
- **Region Preconstruction Engineers** - Responsible for the implementation of the policies, procedures, and personnel of the Preconstruction Division within their respective regions. This includes ensuring compliance with all applicable Permits required for projects to be implemented by the Preconstruction Division.
- **Region Project Managers** – Responsible for managing UDOT projects and leading the project team through concept development, design, advertisement and construction. During project design, the Project Manager works collaboratively with other professionals (Structures, Hydraulics, Landscape Architect, Geotechnical, Environmental, etc.) to assure that projects meet UDOT standards. In addition, they determine whether a SWPPP is required during construction and ensure that temporary and permanent water quality BMPs are included in project documents.
- **Region Design Team Leader** – Responsible for project design documents, specifications and cost estimates which include temporary and permanent water quality BMPs when applicable.
- **Region Environmental Manager** - Responsible for compiling MS4 annual reporting information for inclusion in the Annual Report.

### 1.3.6 SWMP Implementation – Role of Construction Division

The role of the Central Construction Division includes providing direction to the Region Construction on the implementation of water quality management practices associated with Construction activities.

The key UDOT Construction Division positions responsible for implementing stormwater are as follows:

- **State Construction Engineer** - Responsible for all construction contracts and updating, revising, and maintaining construction policies and procedures, specifications and standard drawings, manuals of instruction, and training programs. This includes implementation of elements of the SWMP relevant to construction activities.
- **Region Resident Engineers (RE)** – Responsible for administering Region construction contracts and ensuring that stormwater BMPs are implemented, inspected, and maintained on construction sites as specified in the authorized Stormwater Pollution Prevention Plan (SWPPP). The RE reviews proposed modifications to the project SWPPP and, when necessary, notifies the Contractor of any required changes prior to approval. The RE is responsible for ensuring the SWPPP along with the proper notifications and the Notice of Intent (NOI) are filed with UDEQ through its Online Stormwater Permit Database. The RE makes decisions regarding the acceptance of materials furnished and work performed. The RE also ensures the contractor personnel responsible for implementation of stormwater management measures are properly trained and certified.
- **Environmental Control Supervisor (ECS)** – A designated person on the construction crew responsible for environmental issues during project construction, including SWPPP compliance and inspections of temporary and permanent BMPs for erosion and sediment control.

### 1.3.7 SWMP Implementation – Role of Permitting

The role of the Permitting Section includes providing support to Regions on Encroachment Permits and Agreements. Key positions within the Statewide Permitting are:

- **Permit Program Manager** is responsible for statewide policies and procedures for encroachment permits.
- **Region Permits Officer** coordinates with Permit applicants throughout the permitting process: submittal, review and approval. The Region Permits Officer also coordinates with other UDOT functional units to ensure the proposed activity conforms to policies and standards including stormwater Permit compliance.
- **Region Permits Inspector** is responsible for providing quality assurance and ensuring that the Permittee implements and maintains stormwater BMPs and

may revoke an Encroachment Permit if the Permittee does not comply with Permit conditions.

### 1.3.8 SWMP Implementation – Role of Safety and Risk Management

The role of the Central Safety and Risk Management Section includes developing standard procedures and processes related to public safety and UDOT activities. Key positions within the Statewide Permitting are:

- **Central UDOT Risk and Safety Manager** - Responsible for developing safety procedures and processes for UDOT employees and contractors. The Risk and Safety Manager is also responsible for helping UDOT Regions manage emergency spills and illicit discharges on UDOT roadways and rights of way.
- **Region Safety and Risk Managers** - Responsible for implementing safety and risk management procedures for accidents and spills on UDOT roadways and right of way.

### 1.3.9 SWMP Implementation – Role of Learning and Development

The role of the Learning and Development Section includes developing training to ensure that UDOT staff is adequately trained for all job descriptions. Key positions within the Learning and Development Section are:

- **Chief Learning Officer** – Responsible for all training content on the UDOT U Learning Portal. The Learning Portal allows users to attend online training modules, register training courses and view their training record. This provides a single resource for employee learning, development and documentation of training received.

### 1.3.10 SWMP Implementation – Role of Maintenance Division

The Central Maintenance Division coordinates training of Maintenance Program staff and facilities implementation in the Regions on water quality management practices associated with Maintenance training activities and facilities. Key UDOT Maintenance Planning Division positions and responsibilities include:

- **Director of Maintenance** - Responsible for statewide planning, policies and procedures and training for Region Maintenance staff and provides direction to Region Maintenance programs on water quality management practices and procedures outlined in the SWMP. Also, the Director of Maintenance provides information for the MS4 Annual Report.
- **Region District Engineers** - Responsible for implementing policies, procedures in their area of Region responsibility, oversee the Maintenance Management Quality Assurance (MMQA+) program and provide guidance and direction to Region Maintenance Area Supervisors. In addition, District Engineers are

responsible for ensuring Stormwater Pollution Prevention Plans (SWPPPs) are in place at all maintenance stations and Region equipment shops.

- **Region Maintenance Area Supervisors** – Manage maintenance planning at Regions and provide direction to Maintenance Station Supervisors in their areas of jurisdiction.
- **Region Maintenance Station Supervisors** - Responsible for managing all maintenance responsibilities for their respective maintenance stations. They ensure that SWPPP requirements are being met and are responsible for documenting MS4 Permit compliance activities for their specific station.

## 1.4 Legal Authority

Under the authority granted by the Utah Code 72-1-201, UDOT is responsible for the planning, design, construction and maintenance of all state transportation systems. UDOT will provide adequate finances, staff, equipment and support capabilities to implement the control measures outlined in the SWMP.

UDOT has jurisdiction over facilities constructed within state roadway rights-of-way according to Utah Code 72-7-102 and 72-7-104.

## 2 Special Conditions

### 2.1 Discharges to Water Quality Impaired Waters

#### 2.1.1 Overview

The Utah Division of Water Quality (DWQ) compiles data and conducts analyses to determine whether water quality is sufficient to meet the beneficial uses assigned to Utah's waters and summarizes the results biennially in an Integrated Report. Part 3 of the Integrated Report lists impaired waters that fail to meet water quality standards or are biologically impaired (303(d) List). The report is available at <http://www.deq.utah.gov/ProgramsServices/programs/water/wqmanagement/assessment/>

When a lake, river or stream fails to meet water quality standards, section 303(d) of the Clean Water Act directs the state to place the waterbody on a list of "impaired" waters (referred to as the 303(d) list) and to prepare a plan to restore water quality, called a Total Maximum Daily Load study (TMDL). TMDL studies that have been approved by EPA are available at <http://www.deq.utah.gov/ProgramsServices/programs/water/watersheds/approvedtmdls.htm>

DWQ has consolidated the information found in the Integrated Report and results of TMDL studies into an interactive GIS map. The map is available at <http://enviro.deq.utah.gov/>

#### 2.1.2 Controlling Pollutants of Concern

UDOT utilizes GIS data to determine if stormwater runoff from its MS4 could discharge to a 303(d) listed (impaired) water body. UDOT's MS4 Annual Report includes a list of impaired waters that receive stormwater runoff.

If stormwater runoff discharges to an impaired water body, UDOT will determine if a Total Maximum Daily Load (TMDL) has been approved by EPA. If a TMDL has been approved, UDOT will comply with the requirements of the TMDL that corresponds to UDOT's contribution to the impairment.

If no TMDL has been approved for the impaired water body, appropriate structural BMPs will be selected as part of the design process to address pollutants of concern for each impairment on a project by project basis.

### 2.2 Nitrogen and Phosphorus Reduction

#### 2.2.1 Overview

Nitrogen and phosphorus are nutrients that support the growth of algae and aquatic plants, which provide food and habitat for fish, shellfish and other aquatic organisms.

Excessive nitrogen and phosphorus causes algae to grow faster than ecosystems can handle and can impact aquatic habitats by decreasing the oxygen levels necessary for aquatic species. In addition, some types of algae are harmful to humans because they produce elevated toxins and bacterial growth that can cause illness due to contact with polluted water, tainted fish or shellfish.

### **2.2.2 Nitrogen and Phosphorus Reduction Strategy**

UDOT does not use fertilizers when establishing or maintaining roadside vegetation. Therefore UDOT does not contribute nitrogen and phosphorus being discharged to waters of the state.

Educational materials will be provided on UDOT's web site describing common sources of nutrients and practices to reduce the discharge of nutrients to receiving waters.

## 3 Public Education and Outreach

### 3.1 Overview

UDOT implements a statewide public education and outreach program designed to promote behavior changes that the public can make to reduce water quality impacts associated with stormwater pollutants and illicit discharges. The program also includes education of commercial and industrial entities whose actions may add impair the quality of stormwater discharges to UDOT’s properties and facilities.

### 3.2 Public Education Strategies

#### Participation in Stormwater Organizations

UDOT partners with the Salt Lake County Stormwater Coalition the Utah Stormwater Advisory Council, the Utah Floodplain and Stormwater Management Association to help provide education and outreach on stormwater pollutants and measures to minimize pollutant discharges. Members of the public and governmental staff who attend meetings and conferences sponsored by stormwater organizations gain valuable information on stormwater pollutants, illicit discharges and control measures that reduce the discharge of pollutants to waters of the state.

#### Mass Media

Television media is the most effective tool in educating Utah residents statewide about stormwater pollution prevention. Professionally produced TV commercials provide educational and informational materials to residents on the topic of stormwater, common stormwater pollutants and proper disposal of waste materials. UDOT supports the Salt Lake County Stormwater Coalition in providing mass media educational materials for TV commercials and movie theater pre-feature “cinema spots”.

#### Educational Materials on UDOT Web Site

Educational materials and messaging are developed for posting on UDOT’s web site to address specific pollutants and pollutant sources that could degrade beneficial uses of receiving waters.

## **4 Public Involvement and Participation**

### **4.1 Public Review of the UDOT SWMP**

An opportunity for public input on the UDOT Draft SWMP was provided in accordance with Section 4.2.2 of UDOT's MS4 Permit and state public notice requirements. A legal notice was published in the Salt Lake Tribune and Deseret News on October 5, 2016 and October 19, 2016 and on the Utah Legal Notices website. The notice provided a 30 day public review and comment period.

No public comments on the Draft SWMP were received.

### **4.2 Adopt-A-Highway and Sponsor-A-Highway Program**

The Adopt-A-Highway and Sponsor-A-Highway programs provide opportunities for volunteers to collect litter along the highways and receive recognition for their contribution to keeping the environment and highways clean. As part of these programs, the Region Adopt-A-Highway Coordinators establish partnerships with local organizations, giving individuals, community groups, businesses, and other organizations the opportunity to contribute in cleaning up Utah.

### **4.3 Click 'n Fix Application for Reporting Spills**

The public can report a spill, illegal connection, or illicit discharge using UDOT's Click 'n Fix reporting program. The Click 'n Fix reporting program allows the public to provide information on observed spills and illicit discharges that will be used by UDOT to initiate an investigation and remediate the spill. The Click 'n Fix reporting program is accessible through UDOT's web site or can be downloaded as an application to a smart phone.

## 5 Illicit Discharge Detection and Elimination

### 5.1 Illegal Connection/Illicit Discharge and Illegal Dumping

UDOT has procedures in place for Illicit Discharge Detection and Elimination (IDDE). UDOT has authority over its right-of-way to investigate and resolve Illegal Connections and Illicit Discharges and Illegal Dumping (IC/IDs). Illegal connections are prohibited as they may carry unauthorized drainage, wastewater, pollutants, or other illicit discharges to UDOT's storm drain system from adjacent properties. Illegal connections may be intentional or may be unknown to the property owner. Resolution may include elimination of the connection, or proper permitting of the connection.

Illegal dumping is a discharge characterized by one or multiple occasions of intentional dumping of trash, debris, or other wastes on state highways, facilities, or in receiving waters. Such activity is prohibited by state and local laws and is enforced by the Utah Highway Patrol (UHP) or local law enforcement agencies and UDEQ. UDOT relies primarily upon the UHP for investigation, surveillance, and apprehension of suspects believed to have illegally dumped wastes.

Region Maintenance staff and other stakeholders investigate and resolve reports of suspected IC/IDs. The procedures for discovering, investigating, reporting, and resolving IC/IDs are outlined in the UDOT Illicit Discharge Detection and Elimination (IDDE) Plan.

### 5.2 Dry Weather Screening

UDOT has procedures in place to conduct dry weather screening to support the IDDE Plan. The intent in the dry weather screening is to identify and locate illicit discharges of stormwater runoff to waters of the state.

As part of this program all major outfalls owned and operated by UDOT are inspected and screened for pollutants once per permit cycle. A field data sheet is completed for every outfall inspected noting physical characteristics such as odor, color, clarity, floatables, deposits/stains, and adjacent vegetation as well as other observations which could indicate illicit discharges.

The results of these screenings determine if follow-up activities will be conducted including upstream investigations to determine the source of the discharge. Findings will be reported to the local Health Department for action to eliminate the illicit discharge. Specific procedures for discovering, investigating, reporting findings from outfall screening efforts are outlined in the UDOT's "Dry Weather Screening Plan for Stormwater Outfalls".

## 6 Construction Site Stormwater Runoff Control

### 6.1 Overview

This section describes how UDOT addresses construction activities to reduce the discharge of pollutants from construction sites. This section describes how UDOT will meet the requirements of the UPDES General Permit for Discharges from Construction Activities (Permit Number UTRC00000). Projects that are located within the jurisdiction of federal or tribal lands are subject to the requirements of the U.S. Environmental Protection Agency's (U.S. EPA) 2012 National Pollutant Discharge Elimination System General Permit for Discharges from Construction Activities (Permit Number UTR120001) (CGP). The following sections describe the program to address construction site stormwater runoff.

### 6.2 Construction Project Permit Coverage

All UDOT construction projects are covered by at least one of the permits described below.

1. For projects that disturb 1 or more acres of soil (including less than an acre if it is part of a common plan of development or sale that is over an acre), the UDEQ UPDES General Permit for Discharges from Construction Activities (Permit Number UTRC00000) (Statewide CGP) applies. Construction activity subject to this permit includes earth or land disturbing activities, such as clearing, grading, site preparation (e.g., excavating, cutting, and filling), soil compaction, movement, and stockpiling of top soils.
2. The U.S. EPA CGP is applicable when construction projects cross into federal or Tribal land under the following conditions:
  - a. Construction project will disturb one or more acres of land, or will disturb less than one acre of land but is part of a common plan of development or sale that will ultimately disturb one or more acres of land.
  - b. Includes requirements for permanent structural BMP installation and maintenance, natural buffers to streams, discharge controls, restrictions on chemical treatment, and water quality requirements.

### 6.3 Construction Site Runoff Management

Each region has Resident Engineers (RE) that oversee construction projects. Section 1.3.5 describes key construction position roles and responsibilities regarding stormwater management.

UDOT hires contractors to perform highway construction work. UDOT's contract Standard Specifications require the contractor to manage its work activities in a way that reduces the discharge of pollutants to surface waters, groundwater, and municipal separate storm sewer systems. Additionally, the contract Standard Specifications for water pollution control requires the contractor to monitor and inspect erosion and sediment control BMPs at the job site in accordance with the Statewide CGP.

## 6.4 Administration Activities

Administrative activities related to construction stormwater management address both technical issues and specific UDOT MS4 Permit and Statewide CGP requirements. These administrative activities are described below.

### 6.4.1 Pre-Construction Activities

Activities prior to beginning construction activities may include:

- Conducting a pre-construction meeting with the contractor to discuss required stormwater measures and requirements. This meeting will include a review of the SWPPP, site design, the planned operations at the construction site, the erosion and sediment control BMPs that will be used during the construction phase, and the permanent BMPs that will manage runoff from the project after the construction is completed.
- Ensuring that the Notice of Intent (NOI) has been filed with the UDEQ through its Online Stormwater Permit Database

### 6.4.2 Submittal, Review and Authorization of SWPPPs

The SWPPP is an implementation plan for addressing the temporary impacts of construction activities on stormwater runoff. The SWPPP contains project-specific information related to how the project will be constructed, and a description of the erosion and sediment control BMPs to be deployed at the project site.

### 6.4.3 SWPPP Modifications During Construction

During construction, changes in the site conditions may occur that affect the ability of the contractor to implement the SWPPP as initially authorized, or the ability of the previously authorized SWPPP to meet the objectives for onsite controls. The contractor submits proposed SWPPP modifications to the RE for review. The RE will review the contractor's proposed modification for completeness and conformance with the revised conditions and give approval to the contractor if the modification is acceptable.

### 6.4.4 Project Completion

Before releasing the contractor of any further obligations, the RE must do the following:

- Determine that all disturbed areas are stabilized in conformance with the contract and meets the Statewide CGP or U.S. EPA's CGP final stabilization requirements;
- Require the contractor to remove construction site BMPs that are no longer necessary; and
- Conduct a final walk-through.

## 6.5 Inspections

UDOT staff and the contractor's staff perform stormwater inspections on construction sites. These inspections are crucial for ensuring the erosion and sediment control BMPs are properly maintained and functional. The inspections may reveal that additional

BMPs are needed or that existing permanent structural BMPs can be removed; however, site integrity for stormwater pollution prevention must be maintained. In addition, inspections can help in the planning of permanent structural BMPs for activities not yet implemented, and can help in the formulation of amendments to the SWPPP.

### **6.5.1 Contractor Inspections**

UDOT requires contractors to be responsible for inspecting the site for compliance with the Statewide CGP. To ensure the proper implementation and functioning of erosion and sediment control BMPs, the contractor conducts inspections during periods of active construction as follows:

- At least once a week upon beginning earth disturbing activities; and
- Within 24-hours of the occurrence of a storm event of 0.5 inches or greater

## **6.6 Erosion and Sediment Control BMPs**

The AASHTO Construction Stormwater Field Guide provides information on the design, installation, inspection and maintenance of temporary erosion control measures. The Guide shows best practices for installing and implementing temporary erosion control measures through pictures and graphics and is accessible from UDOT's website:

## **6.7 Project Completion**

When construction projects with a CGP are complete and meet final stabilization requirements of the Statewide CGP or U.S. EPA CGP, the RE or authorized designee will submit a Notice of Termination (NOT) through UDEQ's Online Stormwater Permit Database or U.S. EPA's electronic NOI system, as appropriate.

## 7 Post-Construction Stormwater Management in New Development and Redevelopment

### 7.1 Overview

UDOT provides control measures to manage post-construction stormwater runoff from new development and redevelopment projects that disturb one or more acres of ground, including projects less than one acre that are part of a larger common plan or development or sale.

A goal is for post-development hydrology of new development and redevelopment projects to match the pre-development hydrology of the previously undeveloped site or to improve it for a previously developed site.

### 7.2 New Development and Redevelopment Requirements

Pollution prevention BMPs are included in new development and redevelopment projects that disturb greater than or equal to one acre of soil, including projects less than one acre that are part of a larger common plan or development or sale.

BMPs are selected and designed to protect water quality, minimize life-cycle maintenance costs and resources, provide adequate site access, and to maximize worker and public safety. BMP selection is an iterative process that begins with initial project design activities. The project design process also includes the evaluation of low impact development (LID) measures and structural BMPs to protect water quality and reduce the discharge of pollutants to waters of the state.

As the project progresses into detailed design, the design team revisits the BMP selection process. The design of BMPs is part of the drainage system analysis for the project. Finalized BMPs are included in contract documents that are advertised for construction.

Design methodologies and guidance for post-construction stormwater management BMPs in new development and redevelopment are found in UDOT's Post Construction Water Quality Design Manual.

### 7.3 Site Inspections

Inspections of post-construction BMPs are necessary to ensure adequate ongoing long-term operation, performance and maintenance. BMPs are inspected during construction by qualified UDOT personnel to ensure that all BMPs are constructed in accordance with project plans and specifications.

Inspections and necessary maintenance are conducted annually by either UDOT, by the local municipality or contracted staff through a maintenance agreement. On sites where the property owner/operator is conducting maintenance, UDOT inspects BMPs at least once every five years, or more frequently as determined by UDOT to verify that the BMP is functioning properly and that adequate maintenance is being performed.

## 7.4 Requirements for BMPs

All post-construction BMPs for new development and redevelopment sites must be managed and maintained after construction, whether they are located within or outside of UDOT right-of-way. The MS4 Permit requires adequate access for performing periodic inspections and maintenance activities. UDOT will coordinate with local government entities regarding the management and maintenance of post construction BMPs located outside UDOT right-of-way.

## 7.5 Inventory

UDOT is developing an inventory of post-construction BMPs installed. Information for each post-construction BMP will include:

- Description of each BMP
- Ownership information
- Maintenance requirements (frequency of required maintenance and inspections)
- Inspection information (date, findings, follow up activities and compliance status)

The inventory is updated as appropriate if changes are noted during the inspections.

## 7.6 Enforcement Strategy

Enforcement is achieved by the project contract documents that require contractors to construct UDOT projects according to project plans and specifications. The Resident Engineer (RE) for the project ensures that all elements in contract documents including post-construction BMPs and other pollution prevention measures are implemented by the contractor and sub-contractors.

## 7.7 General Retrofit Plan

UDOT's retrofit plan involves reviewing locations where water quality is being adversely impacted by UDOT facilities. As projects are developed in these locations, BMPs will be studied and included where feasible, to help reduce adverse impacts to water quality.

The following criteria will be considered when developing potential retrofit BMPs:

- Proximity to waterbody
- Status of water body (i.e. impaired, unimpaired, approved TMDLs)
- Hydrologic condition of the receiving waterbody
- Proximity to sensitive ecosystem or protected area
- Sites that could be enhanced by retrofitting

## 8 Pollution Prevention and Good Housekeeping for Municipal Operations

### 8.1 Facilities Operations

Most facilities are managed by the Maintenance division. Such facilities include, but are not limited to, maintenance stations/yards, equipment storage areas, and storage facilities. In addition, other divisions may operate fixed facilities addressed in this section. For facilities under the Maintenance Division, the positions listed in Section 1.3.10 are responsible for implementing the SWMP.

#### 8.1.1 Facility Inventory

Maintenance Division staff have developed an inventory of all UDOT-owned or operated facilities. They will review the inventory annually and update it as necessary. The following types of facilities are included in the inventory, at a minimum:

- Equipment storage and maintenance facilities
- Fuel farms
- Hazardous waste disposal facilities
- Hazardous waste handling and transfer facilities
- Materials storage yards
- Pesticide/Herbicide/fertilizer storage facilities
- Permittee-owned or operated buildings
- Public parking lots
- Salt/sand storage facilities
- Snow disposal/storage areas
- Brine making facilities
- Solid waste handling and transfer facilities
- Street repair and maintenance sites
- Vehicle storage and maintenance yards
- Permittee-owned and/or maintained structural stormwater controls

The facilities, operations and stormwater controls in the inventory are assessed for their potential to discharge stormwater with the following typical pollutants of concern including, but not limited to:

- Total suspended solids (TSS)
- Sediment
- Petroleum products
- Chlorides
- Heavy metals (e.g., Zinc, Lead)

The inventory assessment considers the following:

- Amount of urban pollutants stored at the site
- Identification of improperly stored materials
- Activities performed outside (e.g., changing automotive fluids)

- Proximity to waterbodies
- Poor housekeeping practices
- Discharge of pollutant(s) of concern to impaired water(s)
- Any additional indirect sources of bacteria, chlorine, organic matter, etc. onsite

### 8.1.2 Stormwater Pollution Prevention Plans

The Stormwater Pollution Prevention Plan (SWPPP) describes the activities conducted at a facility and the BMPs to be implemented to reduce or eliminate the discharge of pollutants in stormwater runoff from the facility. A site-specific SWPPP was developed for each UDOT-owned or operated facility and they are retained onsite. A copy of the UDOT UPDES Permit is included with each SWPPP. LID techniques have been incorporated into the design process and will be considered for all new and redeveloped UDOT-owned or operated facilities. Additionally, non-maintenance facilities were evaluated to determine those that may require a site specific SWPPP. UDOT has prepared a SWPPP that will be updated due to any of the following reasons:

- There is a change in design, construction, operation, or site features that may affect the discharge of pollutants to surface water, groundwater, or a MS4;
- If found in violation of any condition of the Permit, or;
- As required by UDEQ or EPA.

UDOT has developed SWPPP templates that address the following:

- Facility Information
- Facility Activities
- Pollutant Source Identification
- Control Measures
- Inspections
- Non-Compliance Reporting
- Potential sources of pollution that may reasonably affect the quality of stormwater discharges associated with facility activities
- A site map that includes the following information:
  - Property boundaries
  - Buildings and impervious surfaces
  - Directions of stormwater flow using arrows
  - Locations of structural control measures
  - Location and name of the nearest defined drainage(s) which could receive runoff from the facility, whether it contains water or not
  - Location of all stormwater conveyances including ditches, pipes, basins, inlets, and swale
  - Locations where the following activities are exposed to stormwater:
    - Fixed fueling operations
    - Vehicle and equipment maintenance and/or cleaning areas
    - Brine making areas
    - Loading/unloading areas
    - Waste storage or disposal areas

- Liquid storage tanks
- Process and equipment operating areas
- Storage or disposal areas for significant materials
- Locations where significant spills or leaks have occurred
- Locations of all analytical and visual stormwater monitoring points
- Locations of stormwater inlets and outfalls, with a unique identification code for each outfall and an approximate outline of the areas draining to each outfall
- Locations of all non-stormwater discharges
- Locations of sources of run-on to the site from adjacent property

Facilities that were not required to develop a SWPPP are still required to control the discharge of pollutants through implementation of appropriate source BMPs, but documented inspections and monitoring are not required. However, if UDOT or UDEQ determines that a non-maintenance facility may discharge pollutants to the stormwater drainage system or directly to surface waters, UDOT will prepare an SWPPP for that facility.

Table shows the facility categories for which SOPs were developed.

**Table 8-1: Facility Minimum Pollution Prevention Procedures**

Facility Category	Minimum Pollution Prevention Procedures
Buildings and Facilities (Offices, Parking Garages, Buildings, or Utilities)	<ul style="list-style-type: none"> <li>• Use, storage, and disposal of chemicals</li> <li>• Establish Spill Prevention Plans (if applicable) and coordinated with the local fire department (as necessary)</li> <li>• Dumpsters and other waste management, including cleaning, washing, painting, and other maintenance activities</li> <li>• Schedules for sweeping parking lots and keeping the facility clean to minimize the runoff of pollutants</li> </ul>
Material Storage Areas, Heavy Equipment Storage Areas and Maintenance Areas	<ul style="list-style-type: none"> <li>• Manage all stored materials with the appropriate BMPs to prevent the discharge of contaminants to the MS4 and Waters of the State</li> <li>• Enclose or cover storage piles of salt or other materials used for deicing to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile (may be waived for salt piles located in areas where surface and/or ground waters are already high in concentrations of salt)</li> </ul>
Right-of-Ways and Open Space	<ul style="list-style-type: none"> <li>• Implement proper application, storage, and disposal of fertilizer, pesticides, and herbicides including minimizing their use and per the manufacturer's instruction</li> <li>• Control of sediment and erosion</li> <li>• Turf maintenance and landscaping activities that ensure practices are protective of water quality such as proper disposal of lawn clippings and vegetation, and use of alternative landscaping materials such as drought tolerant plants</li> <li>• Proper cleaning of maintenance equipment, building exterior, trash containers and the disposal of the associated waste and wastewater</li> </ul>
Vehicle and Equipment	<ul style="list-style-type: none"> <li>• Proper procedures for vehicle maintenance and repair activities, including using drip pans and absorbents under or around leaky vehicles and equipment, or storing leaky vehicles and equipment indoors where feasible</li> <li>• Covering fueling areas (where feasible) to minimize exposure</li> <li>• Preventing vehicle and equipment wash water from discharging to the MS4 or Waters of the State</li> </ul>

Facility Category	Minimum Pollution Prevention Procedures
Roads, Highways, and Parking Lots	<ul style="list-style-type: none"> <li>• Scheduled sweeping for streets, roads, highways, UDOT-owned or operated parking lots designed to reduce road and parking lot debris and other pollutants</li> <li>• Road and parking lot maintenance activities, including pothole repair, pavement marking, sealing and repaving</li> <li>• Cold weather operations activities, including plowing, sanding, deicing compounds application, and maintenance of snow disposal areas</li> <li>• Right-of-Way maintenance, including mowing, herbicide, pesticide and fertilizer applications</li> <li>• UDOT-sponsored events, such as large outdoor festivals)</li> <li>• Prevent snow storage areas from discharging pollutants to receiving waters</li> </ul>
Stormwater Collection and Conveyance System	<ul style="list-style-type: none"> <li>• Scheduled regular inspection, cleaning, and repair of catch basins, stormwater conveyance pipes, ditches, irrigation canals, culverts, structural stormwater controls, structural runoff treatment, and/or flow control facilities</li> <li>• Implementing catch basin cleaning, stormwater system maintenance, scheduled structural BMP inspections and maintenance, and pollution prevention/good housekeeping practices</li> <li>• Prioritize storm sewer system maintenance (with a higher frequency at highest priority areas), based on water quality concerns, condition of the receiving water, amount and type of material that typically accumulates in an area, or other location-specific factors</li> <li>• Inspect all UDOT-owned or operated structural BMPs including swales, retention/detention basins or other structures annually to ensure proper maintenance</li> <li>• Develop, ensure, and document proper disposal methods of all waste and wastewater removed from the stormwater conveyance system, street sweeping, catch basins, and structural BMP cleaning and maintenance. Proper disposal of the materials removed from the MS4 system, including dewatering them in a contained, impervious area and discharging them to a local sanitary sewer (with approval of local authorities) where feasible. Solid material will be stored and disposed of properly to avoid discharge to Waters of the State during a storm event. Other treatment and disposal measures will be reviewed and approved by UDEQ, especially for those materials that may require special handling and disposal if they are prohibited from disposal at a landfill.</li> </ul>

## 8.2 Inspections

All UDOT-owned or operated facilities are inspected by Maintenance Division staff on a weekly and quarterly basis (or more frequently as necessary) at the frequency shown in the inventory.

### 8.2.1 Weekly Visual Inspections

Visual inspections are performed on a weekly basis (or more frequently as necessary) by Maintenance Division staff at their respective facilities. The SOPs describe the areas that should be checked to ensure that the potential for pollutant discharge is minimized. If spills are identified during visual inspections, they are cleaned up immediately to prevent contact with precipitation or runoff. Weekly inspections are tracked in a log kept at each facility, including any identified deficiencies and the corrective actions taken to correct them.

## 8.2.2 Quarterly Visual Inspections

A comprehensive inspection of UDOT facilities are performed at least once per quarter, including all stormwater controls, and documented in an inspection report that is maintained on site at each facility by Maintenance Division staff. High priority pollutant-generating areas at UDOT facilities are visually inspected, including at a minimum and where applicable, waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, salt storage and brine making areas.

## 8.2.3 Quarterly Visual Stormwater Inspections

On a quarterly basis, the quality of stormwater discharges from UDOT facilities is observed by Maintenance Division staff or its contractor. If climatic conditions prevent the visual observation from being performed, UDOT will attempt to evaluate stormwater discharges four times during the wet season. A discharge sample is collected within the first 30 minutes (or as soon as practical, but not to exceed one hour) of when the runoff or snowmelt begins discharging from a storm event that is greater than 0.1 inches that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The observations of each discharge include the following at a minimum:

- Color
- Odor
- Clarity
- Floating Solids
- Settled Solids
- Suspended Solids
- Foam
- Oil Sheen

Any other pollutant indicators are noted as well. No analytical tests of these samples are required. If pollutant indicator observations are made that can be associated with onsite pollutant generating sources, the sources or controls are remedied to prevent further discharge to the storm drain system. The results of visual observations will be documented and maintained with the SWPPP onsite.

## 8.3 Floor Drain Inventory

An inventory of floor drains inside UDOT-owned or operated buildings has been developed by Maintenance Division staff. In addition, site maps and diagrams have been developed. The floor drains and their confirmed discharge locations are documented in the SWPPP, ensuring that only stormwater and other allowable discharges are allowed into these drains and that the appropriate BMPs are in place to minimize pollutants from entering the MS4.

## 8.4 Design of Flood Management Structural Controls

New UDOT flood management structural controls, or those that discharge to the MS4, are designed to minimize the impacts to water quality and hydrology while still meeting

project objectives. Environmental and Hydraulics Division staff reviews the plans of new flood management structural controls to ensure that they minimize impacts to water quality and hydrology.

In addition, existing flood management structural controls are assessed by Environmental and Hydraulics Division staff to determine whether changes or additions are required to improve water quality.

## **8.5 Contractors Performing Maintenance**

If UDOT enlists a contractor to assist with the maintenance of facilities, operations, or structural stormwater BMPs, the contract language documents UDOT's expectations for permit compliance. UDOT ensures that its contracts include contractually required documentation or periodic site visits to confirm that contractors are using appropriate stormwater controls, following the standard operating procedures, implementing adequate stormwater control measures, and good housekeeping practices.

## 9 Industrial and High Risk Runoff Program

### 9.1 Overview

UDOT implements a program for industrial sites that directly connect to UDOT's right-of-way. It addresses industrial facilities that meet the definition in the following three categories (40 CFR 122.26(b)(14)):

- Industrial Facilities subject to the Multi Sector General Permit or Individual UPDES permit
- Facilities subject to Title III of the Superfund Amendments and Reauthorization Act (SARA)
- Hazardous waste treatment, disposal, storage and recovery facilities

### 9.2 Education and Outreach

The program involves providing education and outreach materials (brochures or fact sheets) to industrial sites that either directly connect or propose to connect to UDOT's drainage system. Educational and outreach materials will describe proper management practices and BMPs that prevent pollutants from being discharged to UDOT drainage systems.

For industrial sites that request a Permit to connect to UDOT's drainage system, education materials will be provided to the Permittee along with the Permit application. When reviewing the completed Permit application, proposed BMPs will be reviewed for compliance with UDOT's Policy 08A-06 "Drainage Systems and Offsite Drainage Connections".

### 9.3 UDEQ Notifications

If UDOT determines that storm pollutants from an industrial site are being discharged into UDOT's right-of-way, UDOT is required to submit a written notification to UDEQ within 15 days of its discovery. The following information must be provided by the industrial site operator to UDOT and submitted to UDEQ:

- Discharge location
- Summary of operator's activities or water quality concerns

## 10 Wet Weather Monitoring

### 10.1 Overview

The objective of wet weather monitoring is to estimate pollutant loadings and assess stormwater quality trends from representative transportation land uses. Data obtained from monitoring will be used to estimate pollutants from outfalls, event mean concentrations, annual pollutant loadings and assess the performance of water quality BMPs. Data will also be used to identify and prioritize portions of the MS4 requiring additional controls and identify water quality improvements or degradation.

UDOT has prepared a Wet Weather Monitoring Plan that describes four monitoring sites, the drainage areas for each site, procedures used to conduct monitoring, water quality parameters analyzed and the duration, frequency, and timing of sampling.

UDOT had an agreement with Salt Lake County to provide wet weather monitoring and reporting for the JOR 04 monitoring site which expired in December 2016.

UDOT has hired SWCA Environmental Consultants to perform wet weather monitoring and reporting for all four UDOT monitoring sites, beginning in the spring of 2017.

## 11 Training

### 11.1 Overview

Training is a key component of ensuring that staff implements the SWMP effectively. If changes occur in procedures, methods, or staffing, follow up training will be provided. Training records include dates, activities or course descriptions and staff names. For any consultant firms that perform activities on behalf of UDOT, their staff is trained on UDOT practices and procedures and serve as an extension of UDOT staff.

A summary of the training activities performed during each fiscal year will be included in the Annual Report. The following sections describe the general training topics and activities performed to meet UDOT MS4 Permit requirements.

### 11.2 IDDE Training

#### Stormwater Outfall Screening

UDOT Central stormwater staff provides training to Region Preconstruction staff on the IDDE program and Dry weather screening. Training topics include:

- Background on the UDOT MS4 Permit
- Description of the IDDE Program
- Tools to locate UDOT drainage outfalls – UPLAN GIS map layer “Storm Drain Systems”
- Prioritizing outfalls for site visits
- Procedures for storm drain outfall screening
- Procedures to document observations at outfalls
- Procedures for follow-up on potential illicit discharges and illegal connections

Storm drain outfall screening and follow-up procedures are described in UDOT’s “Dry Weather Screening Plan for Stormwater Outfalls”.

#### Maintenance Facilities

IDDE training is provided semi-annually by UDOT Maintenance through their Maintenance Academy training that is required for all newly hired Transportation Technicians assigned to road crews who perform both roadway maintenance and construction inspections. Additional training is implemented on an as needed basis as determined by Central and Region staff. Training topics include the following:

- Identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills and improper disposal
- Equipment inspections to ensure timely maintenance
- Proper storage of industrial materials, emphasizing pollution prevention
- Proper management and disposal of wastes
- Proper management of dumpsters

- Minimizing the use of salt and other deicing materials, including covering and preventing runoff to the drainage system and ground water contamination
- Proper maintenance of parking lot surfaces, including sweeping

### **11.3 Construction Site Stormwater Runoff Training**

#### Environmental Control Supervisor (ECS) Training Course

In order to increase protection of environmental resources within and adjacent to UDOT construction sites, UDOT often requires the contractor to designate an Environmental Control Supervisor for selected projects. Types of projects that may require an Environmental Control Supervisor include those that have 404 Permits, UPDES Permits, Stream Alteration Permits or other environmental concerns.

UDOT's Environmental Control Supervisor (ECS) on-line training course provides information on the development of project SWPPPs and BMPs to reduce adverse impacts from construction sites on downstream water bodies. The ECS class is taken by UDOT construction inspectors, engineers, and contractor staff. If course attendees pass the exam, a Certificate of completion is provided which allows the attendee to serve as the ECS for construction projects. Those persons who serve as the ECS on UDOT projects must re-take the ECS course every 3 years. ECS certification is required for UDOT personnel in order to advance to the Transportation Technician III level, a career path which all Transportation Technicians are encouraged to pursue.

### **11.4 Post-Construction and New Development/Redevelopment Training**

The specific requirements for post-construction controls and its role in the SWMP is the focus of these training events. In particular, the post-construction SWMP, the planning and review process, inspections, enforcement, and the fundamentals of structural and non-structural control methods are discussed. Training is provided to Project Managers, design engineers, consultant designers, plan review staff and other interested persons at the UDOT Annual Conference and Region training events. Records of training events and materials provided are retained for documentation purposes.

### **11.5 Pollution Prevention/Good Housekeeping Employee Training**

Training will be provided by the Construction and Maintenance Division staff to their respective employees, contracted staff, and other responsible entities that perform construction, operation, or maintenance job functions that are likely to impact stormwater quality. Training courses cover the importance of protecting water quality, the permit requirements, operation and maintenance requirements, inspection procedures, the proper procedures for performing their job activities to prevent or minimize impacts to water quality (as appropriate), the standard procedures for UDOT-owned or operated facilities, and the procedures for reporting water quality concerns, including potential illicit discharges.

## **11.6 Industrial and High Risk Runoff Staff Training**

Training on industrial and high risk runoff focuses on the notification procedures that UDOT staff follows to prevent pollutant discharges from industrial properties that discharge to UDOT's right-of-way. UDOT trains its staff, contracted staff, and other responsible entities upon their hiring and annually thereafter (at a minimum) to inform them about the notification procedures regarding industrial runoff.

## **11.7 Cooperative Agreements Training**

UDOT may have cooperative agreements with other entities to provide specific activities required by the MS4 Permit. UDOT will provide training to the entities' staff on the MS4 Permit requirements for activities outlined in the cooperative agreement.

## 12 Measurable Goals

The SWMP is evaluated on an annual basis to determine whether it effectively meets its overall goals. As required by the MS4 Permit, measurable goals were established to identify milestones and gauge the progress of implementing the SWMP. It consists of three steps:

- **Develop** – Develop programs associated with the UPDES Permit requirements.
- **Implement** – Implement the programs and all UPDES Permit requirements.
- **Evaluate** – Evaluate the development of the programs and their implementation to determine if any program modifications are required.



If the evaluation stage determines that modifications to the SWMP or revised measurable goals are necessary, then the SWMP is updated in the following fiscal year.

Table 12-1 lists the measurable goals identified for each SWMP element and how implementation will be assessed.

**Table 12-1: Measurable Goals**

Item	Implementation Date	Measurable Goal/Action	Assessment
<b>Administrative</b>			
UDOT Draft SWMP Plan	June 30, 2016	Revise the current SWMP Plan to address requirements of the renewed MS4 Permit. Submit Draft SWMP Plan to DEQ/DWQ.	
UDOT Final SWMP Plan	Fall 2016	Update SWMP Plan based on public comments. Submit Final SWMP Plan to DEQ/DWQ. Post Final SWMP Plan on UDOT website.	
Review UDOT SWMP	Annually	Conduct an annual review of the SWMP in preparation for the Annual Report. If modifications of the SWMP Plan are needed, include in Annual Report.	
MS4 Permit Renewal	June 6, 2020	Re-apply for MS4 Permit coverage; submit an NOI to DEQ/DWQ.	Permit renewed by DEQ/DWQ
MS4 Annual Report	October 1 (each year)	Document implementation of SWMP elements and include in Annual Report. Submit Annual Report to DEQ/DWQ	
<b>Monitoring</b>			
Wet and Dry Weather Monitoring Plan	June 30, 2016	Prepare and submit the revised Wet and Dry Weather Monitoring Plan to DEQ/DWQ.	Approval by DEQ/DWQ

Item	Implementation Date	Measurable Goal/Action	Assessment
Wet Weather Monitoring Activities at JOR 3 Outfall	In progress	Continue wet weather monitoring activities at JOR 3 Outfall.	Collect and analyze data from monitoring activities; document findings in Annual Report
Wet Weather Monitoring Activities at 3 new sites	January 1, 2017	Fully Implement revised Wet Weather Monitoring Plan.	Collect and analyze data from monitoring activities; document findings in Annual Report
IDDE Dry Weather Screening	In Progress	Screen 20% of UDOT MS4 Outfalls per year.	Document findings in Annual Report
<b>Public Education and Outreach</b>			
Mass Media Commercials on Stormwater	In progress	Provide mass media commercials to statewide audiences.	Document TV commercials and movie theater “pre-feature” cinema spots provided.
Stormwater educational Information on UDOT’s Web Site	December 2016	Develop up-dated stormwater educational information for the public on stormwater runoff.	Add up-dated educational information to UDOT’s web site. Document number of web site visits if possible.
<b>Public Involvement and Participation</b>			
Public Review of the Draft UDOT SWMP	Fall 2016	Provide an opportunity for the public to review and comment on the Draft SWMP Plan.	Post public comments and UDOT responses on UDOT website.
Adopt-A-Highway Litter Cleanup Program	In progress	Continue to provide the Adopt-A-Highway Litter Removal Program.	Document number of highway miles cleaned
UDOT “Click-N-Fix” Reporting Program	In progress	Annually review the Click-N-Fix program used by the public for reporting spills and pollutant discharges.	Document spills and pollutant discharge events reported. Document final resolution of each incident.
<b>Illicit Discharge Detection and Elimination</b>			
High Priority Areas	October 2016	Develop Procedures for Locating and listing High Priority Areas for IDDE.	N/A
High Priority Area Inspections	Annually	Assess at least 20% of all high priority areas. Document findings in an inspection form. Notify DWQ of dischargers to the MS4 that need a separate UPDES permit (e.g., industrial, dewatering).	20% of high priority areas inspected and documented.
Storm Drain Outfall Maps	December 2016	Finish collecting information on drainage system networks and outfalls in urban areas.	Add to UDOT GIS Layer in UPLAN
Storm Drain Outfall Maps	December 2017	Collect information on drainage system networks and outfalls in rural areas.	Add to UDOT GIS Layer in UPLAN
Storm Drain Outfall Maps	In progress	Revise maps if new outfalls are constructed or modifications to existing outfalls are made.	Add information within one month after construction

Item	Implementation Date	Measurable Goal/Action	Assessment
Administrative Rule on non-stormwater discharges	December 2016	Develop an Administrative Rule describing UDOT's authority to detect, investigate, eliminate and enforce against non-stormwater discharges.	New Rule published in the Utah Administrative Code
Encroachment Permits	In progress	Review Encroachment Permit once during the Permit term and update or modify as necessary.	Approval by Utilities Engineer and UDOT Technical Team
Encroachment Permits	In progress	Implement screening protocol within 2 days after discovery of an illicit discharge.	Document screening activities and findings
<b>Construction Site Stormwater Runoff Control</b>			
UDOT Standard Drawings for Temporary Erosion and Sediment Control (EN1 - EN5)	In progress	Review/modify Standard Drawings once during permit period.	Approval by UDOT Standards Committee
UDOT Standard Drawings for Temporary Erosion and Sediment Control (EN1 - EN5)	In progress	Include Temporary Erosion and Sediment Control Drawings on all projects that: <ul style="list-style-type: none"> <li>Disturb an area greater than or equal to 1 acre in size.</li> <li>Drain to an adjacent water of the state, sensitive environmental area or special aquatic site as defined by the US Army Corps of Engineers.</li> </ul>	N/A
Manual for Temporary Erosion and Sediment Control	In progress	Use the AASHTO Construction Stormwater Field Guide. Distribute latest manual to UDOT construction, maintenance, environmental and design personnel.	N/A
UDOT Stormwater Pollution Prevention Plan (SWPPP)	In progress	Provide a SWPPP for all projects that disturb 1 or more acres of soil surface.	N/A
UDOT Stormwater Pollution Prevention Plan (SWPPP)	In progress	Update the UDOT SWPPP once during permit period.	Incorporate comments provided from environmental, design & construction
UDOT Standard Specification "Environmental Protection"	In progress	Update the Environmental Protection Specification once during permit period.	Approval by UDOT Standards Committee
Stabilized Construction Entrances	In progress	Provide a stabilized construction entrance on all projects that could cause off-site tracking onto paved roadways and highways.	Document effectiveness and improvements needed
Stabilized Construction Entrances	In progress	Update the applicable +specification once during the permit period.	Approval by UDOT Standards Committee
Contractor Rating for Environmental Compliance	In progress	Rate UDOT contractors for each major project.	Document ratings given

Item	Implementation Date	Measurable Goal/Action	Assessment
Contractor Rating for Environmental Compliance	In progress	Review contractor rating system once during the permit period.	Document all modifications made.
<b>Post-Construction Stormwater Management in New Development and Redevelopment</b>			
Post Construction Stormwater BMPs	In progress	Provide post construction stormwater BMPs on projects that disturb 1 or more acres of soil surface.  Develop and distribute a list of BMPs for monitoring purposes.  Document performance and effectiveness 1 year after installation.	Assess performance, document modifications or maintenance needed.
Post Construction Water Quality Design Manual	October 2016	Provide a design manual that describes stormwater quality management for permanent water quantity and water quality controls. Steps include: <ol style="list-style-type: none"> <li>1. Develop the draft design manual</li> <li>2. Review by UDOT Leadership</li> <li>3. Review and approval by DEQ/DWQ</li> <li>4. Provide training to staff</li> <li>5. Implement for all new projects starting January 2017</li> </ol>	Assess performance, document modifications or maintenance needed
<b>Pollution Prevention/Good Housekeeping for Municipal Operations</b>			
Snow Removal and Deicing Practices	In progress	Update the current UDOT Statewide Snow Plan.	Updated Plan Distributed to UDOT Region Maintenance Personnel
Snow Removal and Deicing Practices	In progress	Re-calibrate snow plow spreaders before the snow removal season.	Document re-calibration of equipment
Snow Removal and Deicing Practices	In progress	Continue the UDOT “Snow School” training program for maintenance personnel regarding snow and ice removal practices.	Document training efforts
Salt Piles and Salt Storage	In progress	Cover all salt stockpiles within the Permit period.	Document results
Street Sweeping	In progress	Provide street sweeping in urban areas 2 times per year	Document street sweeping efforts
Street Sweeping	In progress	Provide street sweeping in rural areas once per year	Document street sweeping efforts
Spill Prevention and Response Plan	In progress	Review current spill response procedures once during the permit period.	Document modifications made to current procedures
Herbicide Application	In progress	Evaluate the use and effectiveness of existing and new herbicide products on an annual basis.	Document findings and distribute recommendations

Item	Implementation Date	Measurable Goal/Action	Assessment
Floor Drain Inventory at UDOT Maintenance buildings	December 27, 2016	Develop inventory of floor drains inside Maintenance buildings.	Update inventory annually and verify the discharge locations of new floor drains.
SWPPPs for UDOT Maintenance Stations	Completed June 2016	Develop Maintenance Station SWPPP that include site maps to evaluate stormwater discharges, and ensure that only stormwater and other allowable discharges are allowed in these drains and that appropriate BMPs are in place.	Update SWPPPs as changes are made to Maintenance Stations.
Weekly O & M Inspections	In progress	Perform visual inspections of facilities weekly in accordance with the standard procedures to minimize the potential for pollutant discharge. Check for evidence of spills. Keep inspection records onsite, including noting any deficiencies and corrective actions taken.	Document weekly inspections, identified deficiencies, and corrective actions. Report this information in the Annual Report.
Quarterly O & M Inspections	In progress	Perform visual inspections of facilities quarterly in accordance with the standard procedures to minimize the potential for pollutant discharge. Check for evidence of spills. Keep inspection records onsite, including noting any deficiencies and corrective actions taken.	Document quarterly inspections, identified deficiencies, and corrective actions. Report this information in the Annual Report.
Quarterly Wet Season O & M Discharge Observations	In progress	Perform visual observations of stormwater discharges from UDOT facilities (at least once per quarter, or four times during the wet season if climate conditions preclude). Document visual observations and keep records with the SWPPP, including noting any deficiencies and corrective actions taken.	Document visual observations, identified deficiencies, and corrective actions. Report this information in the Annual Report.
<b>Industrial and High Risk Runoff Program</b>			
Industrial Facilities Outreach and Visual Monitoring	December 2016	Develop and distribute educational materials to industrial facilities known to discharge to UDOT right of way. Submit written notification to UDEQ identifying the location of the discharge within 15 days of the discovery.	Track notifications submitted to UDEQ. Report this information in the Annual Report.
Industrial Facility Connections Map Procedures	December 2016	Develop and implement standard procedures for adding new industrial facility connections to the storm sewer map.	Develop procedures and implement them by tracking the connections added. Report this information in the Annual Report.
<b>Training</b>			
Train All Employees, Contracted Staff, and Other Responsible Entities	In Progress	Provide training to employees, contracted staff, and other responsible entities about the Permit requirements and the proper procedures for implementing the permit within their job activities. Keep training records for annual reporting.	Train all employees, contracted staff, and other responsible entities. Report this information in the Annual Report.

Item	Implementation Date	Measurable Goal/Action	Assessment
UDOT Environmental Control Supervisor (ECS) Training	In progress	Provide training to UDOT construction staff and contractor staff on: <ul style="list-style-type: none"> <li>• Construction Permit</li> <li>• Erosion and sediment control BMPs</li> <li>• Plan reviews</li> <li>• Site inspections and enforcement</li> </ul> Review training materials on a bi-annual basis.	Retain a list of all who have taken and passed the UDOT ECS course and other training courses.  Document changes made to training materials
IDDE Training	In progress	Provide training to employees, contracted staff, and other responsible entities about the IDDE program including identification and termination of illicit discharges and illegal connections.	Document training provided in the Annual Report
Post Construction BMP Training	In progress	Provide training to UDOT design staff and contracted staff on post-construction BMPs.	Document training provided in the Annual Report.
Spill Prevention and Response Plan	In progress	Provide annual training to maintenance personnel regarding spill prevention and response.	Document training provided.
Herbicide Application	In progress	Provide annual training on latest best practices and herbicide application techniques.	Document training efforts

## 13 Reporting

### 13.1 Annual Report

UDOT is required to submit an annual report to UDEQ by October 1 that documents the activities accomplished during the prior fiscal year (July 1 through June 30). The format of the annual report is consistent with what was prepared for the previous permit term. The following information is included in the annual report:

- Current Stormwater Management Program (SWMP) document, including any modifications made during the fiscal year as a result of the minimal annual review required by the UPDES Permit.
- Status of implementing the UPDES Permit conditions of the SWMP components that are required, including the compliance status of any scheduled items.
- A summary of the data, including monitoring data, accumulated through the reporting year for wet weather and dry weather screening, including conclusions concerning what is shown by the data and how Permit objectives are being or are not being met.
- A summary describing the number and nature of enforcement actions, inspections, and public education programs.
- Annual expenditures for UPDES Permit compliance for the prior fiscal year and projected budget for the upcoming fiscal year.
- Identification of long-term water quality improvements or degradation.

The annual report is signed by UDOT and certified in accordance with the UPDES Permit requirements.

## Appendix A: Reference List

**Table A-1: UDOT Stormwater Management Program Reference List**

Title	Website Hyperlink
EN Series Standard Drawings for Temporary Erosion Control (EN 1 – EN 7)	<a href="http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:3792">http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:3792</a>
AASHTO Construction Stormwater Field Guide	<a href="http://www.udot.utah.gov/main/uconowner.gf?n=28956600394583344">http://www.udot.utah.gov/main/uconowner.gf?n=28956600394583344</a>
UDOT Stormwater Pollution Prevention Plan Outline	<a href="http://www.udot.utah.gov/main/uconowner.gf?n=14087427668812613">http://www.udot.utah.gov/main/uconowner.gf?n=14087427668812613</a>
UDOT Standard Specification 1355 titled “Environmental Protection” and UDOT Standard Specification 1571 titled “Environmental Controls”	<a href="http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:302">http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:302</a>
UDOT Spill Prevention and Response Plan for Maintenance Stations and Construction Sites	<a href="http://www.udot.utah.gov/main/uconowner.gf?n=13387732701099139">http://www.udot.utah.gov/main/uconowner.gf?n=13387732701099139</a>
UDOT Click ‘n Fix	<a href="http://www.udot.utah.gov/main/f?p=100:pg:0:::t,v:376">http://www.udot.utah.gov/main/f?p=100:pg:0:::t,v:376</a>
UDOT Spills and Illicit Discharge Detection and Elimination	<a href="http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:2652,71461">http://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:2652,71461</a>
UDOT Stormwater Information and Permitting	<a href="http://www.udot.utah.gov/main/f?p=100:pg:0:::V,T:,2652">http://www.udot.utah.gov/main/f?p=100:pg:0:::V,T:,2652</a>



## **Appendix B: UDOT Best Management Practices Fact Sheets**

## Public Education and Outreach on Stormwater Impacts

### BMP - Television Commercials on Stormwater

#### Objective

Increase public awareness of stormwater and the effects of common pollutants. Inform and educate the public on ways to minimize the discharge of pollutants to storm drain systems.

#### Description

Professionally produced TV commercials provide educational and informational materials to residents on the topic of stormwater, common stormwater pollutants and proper disposal of waste materials.

Television commercials are broadcast on major networks to audiences statewide and focus on stormwater quality. Commercials describe stormwater, common pollutants, and ways the public can prevent and minimize pollutants from being discharged to storm drain systems.

UDOT supports the Salt Lake County Stormwater Coalition in providing mass media educational materials for TV commercials and movie theater pre-feature “cinema spots”. Salt Lake County hired a consultant that developed and produced the TV commercials as well as other mass-educational materials.

#### Decision Process

Television media is the most effective tool in educating Utah residents statewide about stormwater pollution prevention. Target audiences include all residents, business and property owners throughout Utah. Target pollution sources include common household hazardous wastes and litter, vehicle fluids/wash water and lawn care chemicals.

#### Staffing

This BMP involves yearly financial support to Salt Lake County. Except for general coordination activities, no UDOT staffing resources are required.

## BMP - Stormwater Information on UDOT’s Web Site

### Objective

Increase public awareness of stormwater and the effects of pollutants. Educate the public on ways to minimize the discharge of pollutants to storm drain systems.

### Description

Provide on-line information that explains what stormwater is and how pollutants from stormwater can impact the aquatic environment. Information directly on the web site or on web links would describe how to properly dispose of common household wastes and include steps to reduce the discharge of pollutants to rivers, streams and stormwater facilities. In addition, the web site will provide the opportunity for the public to email information to staff on potential problems, illicit discharges or spills.

Educational materials and messaging are developed for posting on UDOT’s web site to address specific pollutants and pollutant sources that could degrade beneficial uses of receiving waters. Materials may include the categories and topics shown in the Table below.

### Decision Process

Many highway users access UDOT’s web site to obtain information on transportation projects and traffic conditions. Web based information is an effective way to inform and educate the public on issues regarding stormwater quality and the ultimate destination of stormwater runoff.

The target audience for this BMP includes residents, business and property owners, and all other interested individuals and groups that may desire to obtain transportation information via the web site. Target pollutant sources described will include litter, common household hazardous wastes, vehicle fluids and lawn care chemicals.

### Staffing

The Central Stormwater Coordinator will work with the UDOT Web Manager to add and update stormwater information on the web site.

Public Education and Outreach Topics	
Category	Topics
Stormwater pollutants and pollutant sources that may impact receiving water beneficial uses.	<ul style="list-style-type: none"> <li>• Impacts from stormwater discharges.</li> <li>• Measures that individuals can take to avoid, minimize, reduce and/or eliminate pollutant discharges to storm drainage systems.</li> </ul>
Illicit discharges and improper disposal of wastes	<ul style="list-style-type: none"> <li>• Maintenance of septic systems</li> <li>• Effects of automotive work and car washing on water quality</li> <li>• Proper disposal of swimming pool water</li> <li>• Proper disposal of household hazardous waste</li> <li>• Proper disposal of used motor oil</li> <li>• Proper management of pet waste</li> </ul>

Public Education and Outreach Topics	
Category	Topics
Business, commercial and industrial facilities	<ul style="list-style-type: none"> <li>• Proper lawn maintenance and the use of pesticides, herbicides, and fertilizer</li> <li>• Benefits of appropriate on-site infiltration of stormwater</li> <li>• Building and equipment maintenance, including the proper management of waste water</li> <li>• Proper storage of materials, emphasizing pollution prevention</li> <li>• Proper management of waste materials and dumpsters, including covering practices and pollution prevention</li> <li>• Proper management of parking lot surfaces, including sweeping</li> </ul>
Applicators and distributors of pesticides, herbicides, and fertilizers	<ul style="list-style-type: none"> <li>• Proper use, application, and disposal of pesticides, herbicides, and fertilizers</li> </ul>

## Public Involvement and Participation

### BMP - Stormwater Comment Opportunity via UDOT's Web Site

#### Objective

Provide an on-line opportunity to the public to submit comments and suggestions regarding stormwater issues.

#### Description

Stormwater Information directly on UDOT's web site or on web links would describe how stormwater is managed on transportation projects. UDOT's web site will provide the opportunity for the public to comment on these management strategies and email suggestions to UDOT staff. The web site will also provide an e-mail opportunity and telephone number/contact person for the public to share information on potential stormwater problems, illicit discharges or spills.

#### Decision Process

Many highway users access UDOT's web site to obtain information on transportation projects and traffic conditions. Web based information is an effective way to inform and educate the public on issues regarding stormwater quality and management techniques.

The target audience for this BMP includes residents, business and property owners, and all other interested individuals and groups that may desire to obtain transportation information via the web site. Target pollutant sources described will include litter, common household hazardous wastes, vehicle fluids and lawn care chemicals.

#### Staffing

The Central Stormwater Coordinator will work with the UDOT Web Manager to update information on the web site.

## **BMP - Adopt-A-Highway Litter Cleanup Program**

### Objective

Provide the public an opportunity to be involved and participate in UDOT's litter cleanup program on state roadways and highways. The objective of this BMP is to prevent litter and associated pollutants from being discharged to downstream drainage facilities and receiving waters.

### Description

The "Adopt a Highway" program is a cleanup effort by volunteers from various groups who collect and remove litter on a specific segment of interstate highway or local state roadway. UDOT provides litter bags and collects the bags and disposes of the waste material at a local landfill.

### Decision Process

Each "Adopt-A-Highway" group involved collects litter on a two mile segment of roadway right of way a minimum of three times per year.

By participating in the Adopt-A-Highway program, members of the public learn firsthand, the effects of litter pollution on roadside areas and the importance of proper disposal. To recognize the efforts of the group, UDOT erects a sign on that section of roadway with the group's name.

### Staffing

- Region Adopt-A-Highway Coordinators

## **BMP – UDOT Click ‘n Fix Application**

### Objective

Provide an opportunity for the public to report potential locations of spills and illicit discharges.

### Description

The public can report a spill, illicit discharge or illegal connection using UDOT’s Click ‘n Fix reporting program. The Click ‘n Fix reporting program allows the public to provide location information on observed spills and illicit discharges that will be used by UDOT to investigate the spill and arrange for cleanup. The Click ‘n Fix reporting program is accessible through UDOT’s web site or can be downloaded as an application to a smart phone.

### Decision Process

By using in the Click ‘n Fix application, members of the public participate in the effort to locate and stop pollutant discharges. The public also learns the importance of proper disposal of waste materials.

### Staffing

- UDOT Central Stormwater Coordinator
- Region Safety/Risk Managers
- UDOT Central Community Relations Staff

## Illicit Discharge Detection and Elimination

### BMP – Storm Drain Outfall Maps

#### Objective

Develop maps that show UDOT MS4 drainage systems and outfalls.

#### Description

A GIS layer titled “Stormwater Drainage Systems” has been created in UDOT’s UPLAN Map Center and information on existing drainage systems has been added. This GIS layer serves as the tool for showing the Department’s statewide MS4 drainage systems, associated outfalls, water quality structural controls and waters of the state. Available Information on local drainage systems has also been added to this GIS layer, which will help in tracking potential illegal connections and illicit discharges. This layer is accessible to UDOT staff for adding new drainage features and editing existing features as modifications are made.

#### Decision Process

Implementation of this BMP will help show locations of drainage systems and associated outfalls for the purposes of dry weather screening by UDOT Region staff.

#### Staffing

Staffing for this BMP includes:

- Central GIS staff
- Region Environmental Engineer
- Region Hydraulics Engineer
- Region GIS staff

## BMP – Stormwater Outfall Screening

### Objective

The objective of outfall screening is to eliminate sources of non-stormwater discharges to the MS4 and waters of the state.

### Description

Stormwater outfall screening involves identifying drainage system outfalls, performing field investigations during periods of dry weather and assessing the potential for illicit discharges to the MS4.

### Decision Process

Observations of stormwater flow at outlets can reveal information about the pollutant type and possible source for locating the connection and eliminating the discharge. Illicit discharges often result in changes in physical and chemical characteristics of water. Drainage system outfalls will be inspected during dry weather conditions (72 hours since the previous storm) for the following indicators of pollutants:

Odor – Odor can sometimes indicate the source of contamination. Industrial discharges may result in an odor that would suggest contamination from oil, gasoline, chemicals or solvents. Industries related to food production could discharge organic substances into drainage facilities which would convey associated odors downstream.

Color – Color is another indicator of illicit discharges, especially from industrial sources.

Color	Possible Source
Brown, Gray or Black	Industrial Sources
Reddish-Brown	Meat Processing
Yellow	Plating Mill Industries

Clarity – discharges that are cloudy may result from concrete mixing or stone related industries. In addition, sanitary wastewater can be cloudy.

Floatable Matter – discharges may also have floatable matter that could indicate possible sources.

Deposits and Stains – Deposits and stains can remain on surfaces after illicit discharges have ceased. However, not all deposits are the result of illicit discharges. Natural water sources that have a high degree of natural hardness may result in deposits at the flow line of pipe culverts and at outlet structures.

Vegetation - Vegetation adjacent to the outfall could be affected if the discharge is other than stormwater. Plant growth may be stunted if the discharge is too

acidic. Plants will continue to show effects of contamination even after the flow has ceased.

A field data sheet will be completed for every outfall inspected. Follow-up activities will be conducted for locations where pollutants indicate possible illicit discharges. If observations indicate possible pollutant discharges, the drainage system upstream will be investigated in further detail to determine the source of the discharge. Findings will be reported to the local Health Department for action to eliminate the illicit discharge. All enforcement actions taken will be documented.

Outfall screening is described in the UDOTs “Dry Weather Screening Plan for Stormwater Outfalls”

#### Staffing

Staffing for this BMP includes:

- Region staff

## **BMP – Encroachment Permits**

### Objective

Prohibit/eliminate illicit discharges of stormwater and pollutants from entering UDOT drainage facilities and right of way.

### Description

Entities proposing to connect into the Department's drainage system must file a permit application and enter into an Agreement with the Department. The following conditions apply for proposed drainage connections:

1. The Department must have a drainage system that can accept additional stormwater runoff.
2. No connection will be allowed if the Department's drainage system depends entirely on subsurface infiltration such as infiltration trenches, infiltration basins, dry wells, sumps or similar features.
3. Flows from offsite areas must not exceed the capacity of the drainage system or interfere with the Department's ability to use its drainage system.
4. The quantity of stormwater discharged into the Department's drainage system for the 10 year storm event must not exceed 0.2 cubic feet per second per acre of developed area.
5. Size the storage facility and outlet structure to contain the 100-year storm event while providing 1 foot of freeboard from the water surface elevation to the top of the facility.
6. Pollutants and contaminants must be removed prior to entering the Department's drainage system using water quality controls.
7. Offsite drainage is not allowed to pond within the Department's Right of Way unless authorized by the Department in writing.
8. The requesting entity pays the cost of connecting to the Department's drainage system..

### Decision Process

Encroachment permits can help prevent/eliminate unauthorized discharges of stormwater and pollutants from entering UDOT storm drain facilities and right of way. Failure to obtain an encroachment permit is a violation of UDOT Policy and enforcement actions are taken against those responsible. Enforcement against parties responsible would be accomplished by UDOT, with punitive measures being levied by the local health department with jurisdiction over the area.

### Staffing

Staffing for this BMP includes the UDOT Region Hydraulics Engineer and the UDOT Region Permits Officer

## **Construction Site Stormwater Runoff Control**

### **BMP – UDOT Standard Drawings for Temporary Erosion and Sediment Control**

#### Objective

Minimize the discharge of construction site pollutants to stormwater conveyance systems.

#### Description

This BMP consists of UDOT Standard Drawings that describe temporary erosion and sediment control measures used on UDOT construction and maintenance projects. These drawings describe the necessary elements of each control measure and how each measure is to be constructed. UDOT Standard Drawings for temporary erosion control include:

EN 01: Check Dams

EN 02: Silt Fence

EN 03: Slope Drain and Temporary Berm

EN 04: Drop Inlet Barriers

EN 05: Pipe Inlet and Curb Inlet Barriers

EN 06: Sediment Trap and Stabilized Construction Entrance

EN 07: Straw Bale Barrier

#### Strategy

Control measures listed above are designed to trap pollutants in stormwater prior to discharge from the construction site. Temporary erosion and sediment control measures can reduce erosion and sediment loss by approximately 80%.

#### Staffing

Staffing for this BMP includes:

- Region Environmental Staff
- Region Design Staff
- Region Construction Staff

## BMP – UDOT Standard Specification 01571 “Environmental Controls”

### Objective

Outline requirements for controlling erosion and capturing sediment laden runoff from UDOT construction sites.

### Description

This specification includes descriptions, materials, installation and inspection requirements of temporary and permanent erosion control measures. The requirements described in this specification are contractual and ensure that control measures will meet UDOT standards when installed. The environmental control measures include:

Temporary Control Measures	Permanent Control Measures
Channel Liner	Topsoil and Seeding
Erosion Control Blanket	Turf Reinforcement Mat
Wood Fiber Mulch	
Hydraulically Applied Medium (Bonded Fiber Matrix)	
Check Dams <sup>1</sup>	
Silt Fence <sup>1</sup>	
Slope Drain and Temporary Berm <sup>1</sup>	
Drop Inlet Barriers <sup>1</sup>	
Pipe Inlet Barrier and Curb Inlet Barriers <sup>1</sup>	
Straw Bale Barrier <sup>1</sup>	
Sediment Trap <sup>1</sup>	
Stabilized Construction Entrance <sup>1</sup>	
Environmental Fence	

<sup>1</sup> Installation details are shown in the UDOT “EN” Series Standard Drawings

### Strategy

The specification outlines UDOT requirements and installation standards for contractors, provides an enforcement mechanism and allows for liquidated damages to be assessed against the contractor in the event of non-compliance.

### Staffing

Staffing for this BMP includes:

- UDOT Region Construction Staff

## **BMP – AASHTO Construction Stormwater Field Guide for Temporary Erosion and Sediment Control**

### Objective

Provide guidance to construction staff to minimize the discharge of construction site pollutants offsite areas and waterways.

### Description

The AASHTO Construction Field Guide is a quick reference for construction inspectors and resident engineers in on topics related to installation, maintenance and inspection of sediment and erosion control BMPs. The guide includes information on installation, inspection and maintenance of temporary erosion control measures:

- Chapter 1 – Introduction: Scope, Objective and NPDES Regulations
- Chapter 2 – Pollution Prevention and General Housekeeping
- Chapter 3 – Sediment Control
- Chapter 4 – Erosion Control
- Chapter 5 – Temporary Drainage Management

The AASHTO Construction Field Guide replaces the UDOT Erosion and Sediment Control Field Guide.

### Strategy

The field guide is a useful tool that is concise enough to be carried from job site to job site. Using this guide helps projects stay in compliance with federal and state water quality regulations. Common problems with erosion/sediment control measures on construction sites can be identified and information on effective BMPs is provided.

## **BMP – UDOT Stormwater Pollution Prevention Plan (SWPPP)**

### Objective

Minimize the discharge of construction site pollutants to offsite areas and waterways.

### Description

The SWPPP is an implementation and documentation plan used for stormwater management on construction projects. This document outlines responsible parties, construction activities and schedules, permit requirements, spill response, maps, inspections, plans, details and for minimizing the discharge of pollutants from construction projects. BMPs include temporary erosion and sediment control measures that address construction activities and permanent measures that address erosion control for the life of the project. SWPPPs also include post-construction low impact development (LID) water quality measures and non-LID measures to be constructed on the project.

SWPPPs are developed for all projects that will disturb one or more acres of soil in accordance with the Construction General Permit for Stormwater Discharges. In addition, SWPPPs are developed for all projects (regardless of acreage disturbed) that are adjacent to waters of the state, sensitive environmental areas or special aquatic sites as defined by the US Army Corps of Engineers.

### Strategy

Providing SWPPPs for projects enables construction staff to manage construction site pollutants and helps prevent pollutants from being discharged to offsite areas and waterways.

### Staffing

Staffing for this BMP is comprised of:

- UDOT Landscape Architects
- Region Design Engineer
- Region Design Technicians

## **BMP – UDOT Standard Specification 01355 “Environmental Compliance”**

### Objective

Provide guidance and direction to comply with federal and state environmental regulations.

### Description

This specification applies to all UDOT projects and outlines specific actions to be taken and requirements necessary for environmental compliance. Topics include:

- Hazardous Materials Discovered During Construction
- Hazardous Spills Caused by the Contractor
- Water Resource Permits
- Open Burning
- Fugitive Dust
- Noise Control
- Environmental Clearance by the Contractor
- Discovery of Historical, Archaeological, or Paleontological Objects, Features or Human Remains

### Strategy

This specification is part of the UDOT Standard Specifications for Road and Bridge Construction that are included as part of contract documents for projects.

### Staffing

Staffing for this BMP is comprised of:

- UDOT Standards Committee
- UDOT Central Environmental Staff

## **BMP – UDOT Environmental Control Supervisor (ECS) Training**

### Objective

Increase protection of environmental resources within and adjacent to UDOT construction sites.

### Description

In order to increase protection of environmental resources within and adjacent to UDOT construction sites, UDOT often requires the contractor to designate an Environmental Control Supervisor for selected projects. Types of projects that may require an Environmental Control Supervisor include those that have 404 Permits, UPDES Permits, Stream Alteration Permits or other environmental concerns.

### Strategy

UDOT's Environmental Control Supervisor (ECS) on-line training course provides information on the development of project SWPPPs and BMPs to reduce adverse impacts from construction sites on downstream water bodies. The ECS class is taken by UDOT construction inspectors, engineers, and contractor staff. If course attendees pass the exam, a Certificate of completion is provided which allows the attendee to serve as the ECS for construction projects. Those persons who serve as the ECS on UDOT projects must re-take the ECS course every 3 years. ECS certification is required for UDOT personnel in order to advance to the Transportation Technician III level, a career path which all Transportation Technicians are encouraged to pursue. Documentation of all individuals certified as an ECS is accomplished through UDOT's Learning Management System (LMS).

The responsibilities of the ECS include:

- Inspecting the project site for compliance with UPDES Construction General Permit for stormwater discharges and other environmental permits
- Maintaining temporary erosion and sediment control measures
- Modifying the project SWPPP as required
- Ensuring that environmental clearances are obtained for off-site work
- Coordinating with the UDOT construction crew's ECS
- Ensuring that environmental mitigation commitments are followed on the project

### Staffing

Staffing for this BMP includes:

- UDOT Central Environmental Services staff
- UDOT Central Construction staff

## **BMP – UDOT General Environmental Training**

### Objective

Provide instruction and guidance to UDOT project managers, designers, maintenance staff, construction inspectors and design technicians on environmental issues common to transportation projects.

### Description

UDOT Environmental Services provides training to staff on a variety of environmental topics. This training will inform and educate employees on UDOT's environmental ethic and provide the tools necessary to help minimize potential adverse impacts to the natural and built environment.

Environmental topics related to pollution prevention and water quality include:

- Point & Non-Point Source Pollution
- Temporary Erosion/Sediment Control
- Waters of the US, Including Wetlands
- Stream Channel Alterations
- Mitigation Commitments
- Hazardous Materials
- Water Quality Permits

### Strategy

Providing training to UDOT staff in a variety of environmental issues will educate staff and provide guidance on best management practices to minimize environmental impacts. This training will help reduce the discharge of pollutants to environmental resources including waterways.

### Staffing

Staffing for this BMP includes:

- UDOT' Central Environmental Services
- UDOT Stormwater Coordinator

## **BMP – Contractor Rating for Environmental Compliance**

### Objective

Increase contractor environmental sensitivity in the construction phase.

### Description

UDOT has a rating system that provides an opportunity for UDOT construction staff to comment on contractor performance for each project. Contractor performance is rated by the UDOT resident engineer on quality control/workmanship, traffic control, EEO/labor compliance, organization/supervision, partnering, schedule, public relations and environmental compliance. An overall score of 70 or below (out of 100) is considered failing. If the overall rating score falls below 70, the contractor is no longer pre-qualified to bid on major UDOT projects. A project is considered “major” if the estimated construction cost is likely to exceed \$500,000. The rating for environmental compliance includes the following issues:

- Hazardous Waste Requirements
- Air Quality
- Clearances for off-site work
- Invasive Weed Control
- UPDES Permit Requirements
- 404/Stream Alteration Permit Requirements
- Temporary Erosion Control

### Strategy

A rating system for contractors gives UDOT management an indication of how they are performing on a variety of issues. It also provides feedback on areas in which the contractor needs additional training and guidance. This system also provides a way to recognize high quality work and preclude those contractors who have done poor quality work from bidding on major UDOT projects.

### Staffing

Staffing for this BMP includes:

- UDOT Resident Engineers

## Post-Construction Stormwater Management in New Development and Redevelopment

### BMP – Post Construction Water Quality Design Manual

#### Objective

Provide a stand-alone design manual to assist designers in selecting and designing post-construction (permanent) water quality controls for UDOT projects.

#### Description

Post-construction BMPs described in the design manual will include state of the art structural BMPs and low impact development (LID) BMPs for use on UDOT projects. The manual will contain design information, guidance and requirements as well as information to estimate the effectiveness of BMPs. Topics will include UDOT's MS4 Stormwater Permit, UDOT's Stormwater Management Program (SWMP), BMP selection and design, common transportation related pollutants, flow based treatment BMPs and volume reduction measures. BMPs will include:

- Vegetated Strips and Swales
- Infiltration Measures
- Detention Measures
- Gross Solids Removal Devices
- Media Filters
- Wet Basin
- Open Graded Surface Course

Refer to the Design Manual for detailed descriptions of the selection and design of post-construction BMPs.

#### Strategy

Providing a single design manual for UDOT staff and contracted staff that outlines post-construction BMP requirements is critical for statewide consistency and Permit compliance. This manual will help educate design staff how to design post-construction BMPs that will reduce transportation related pollutants from being discharged to waters of the state.

## Pollution Prevention/Good Housekeeping for Municipal Operations

### BMP – Maintenance Station Stormwater Pollution Prevention Plan (SWPPP)

#### Objective

The objective of Maintenance Station SWPPPs is to identify possible pollutant sources and activities and outline practices and control measures that will reduce the discharge of pollutants from UDOT facilities to offsite areas and waterways.

#### Description

A SWPPP is prepared for each UDOT maintenance station statewide. Each SWPPP includes a site map showing storage areas for equipment, fuel, chemicals, salt and brine making. Site maps also show parking lots, office buildings, maintenance shops, drainage systems, detention/retention basins and nearby receiving waters, if present.

SWPPPs also include a discussion of pollutants of concern from maintenance activities, standard operating procedures (SOPs) for material storage and vehicle equipment repair. SWPPPs also include information on specific BMPs, training, stormwater and non-stormwater discharges and inspections.

SWPPPs have been developed to meet the following objectives:

- Identify pollutant sources that may affect the quality of stormwater discharges;
- Identify potential pathways and conveyances for pollutants to discharge from the facility, and
- Identify, assign, and implement control measures and best management practices to reduce or prevent pollutants in stormwater discharges.

#### Strategy

UDOT is required to reduce the discharge of pollutants associated with stormwater runoff from UDOT-owned facilities. The SWPPP is a planning, evaluating, implementing and reporting tool that is used to ensure compliance with the MS4 Permit.

#### Staffing

Staffing for this BMP is derived from:

- UDOT Central Maintenance Division
- UDOT Region Maintenance Area Supervisors, Station Supervisors
- UDOT Region Maintenance staff

## **BMP – Snow Removal and Deicing Practices**

### Objective

Operate and maintain UDOT roadways and maintenance facilities while incorporating best management practices to reduce the discharge of pollutants to the surrounding environment.

### Description

Snow and ice are removed from UDOT roadways to provide a safe transportation system for the traveling public. Snow and ice are removed from traveled lanes, storage lanes, shoulders and gore areas. Several types of snow and ice removal are incorporated:

#### Anti Icing Technology :

This technology consists of treating the roadway surface with liquid chemicals such as sodium chloride and magnesium chloride to prevent the accumulation of snow and ice. A mixture of salt and water referred to as brine is applied first to roadway surfaces to help prevent the formation of ice. This method is used in the Weber County, Salt Lake County and Utah County urbanized areas. Magnesium chloride is very effective against snow and ice and has fewer adverse effects commonly attributed to salt.

#### Traditional Snow and Ice Removal Methods:

Plowing is done and ice control materials are applied at a frequency to avoid snow accumulation of 2 inches. In rural areas salt and grit are used to remove ice at a ratio of (2) parts grit to (1) part salt. Grit is not used in the Salt Lake County urbanized area because particulate matter is an air quality concern. Currently, snow plow spreaders are re-calibrated at least twice a year, more often if required.

Remote Weather Information Systems (RWIS) are used on all major interstate highways and major rural arterial roadways. These systems record pavement surface temperatures and other weather information. With this data, maintenance crews can plan ahead and treat roadway surfaces early, before ice accumulates from winter storm events.

### Strategy

The practices described above are designed to provide transportation facilities that are free of ice and snow while minimizing the discharge of pollutants to the surrounding environment. A key strategy is to apply only the minimum quantity of deicing agent necessary to remove ice from roadway facilities. UDOT has a Statewide Snow Plan which includes information on current practices regarding snow and ice removal, deicing chemicals, equipment and application techniques

### Staffing

Staffing for deicing and snow removal include:

- UDOT Central Maintenance
- UDOT Region Maintenance Area Supervisors and Station Supervisors
- UDOT Region Maintenance staff

## **BMP – Salt Piles and Salt Storage**

### Objective

Prevent salt and storm runoff containing salt from polluting stormwater and adversely affecting downstream environmental resources.

### Description

Salt is an important material in UDOT's winter road maintenance program. UDOT has approximately 120 stock piles of salt throughout the state. Many existing salt piles are covered, preventing storm runoff from contacting the material. Most salt pile facilities not covered have retention ponds that contain stormwater runoff. It is important to prevent salt and brine from migrating to downstream drainage facilities and receiving waters.

### Strategy

Excessive quantities of salt can cause adverse impacts to aquatic environments and roadside vegetation. Therefore, it is important to incorporate best management practices to contain salt and salt leachate in order to store this material properly.

### Staffing

Staffing for this BMP includes

- UDOT Region Maintenance Area Supervisors and Station Supervisors
- UDOT Region Maintenance staff

## **BMP – Street Sweeping**

### Objective

Remove particulates and debris from paved roadway surfaces.

### Description

All state paved roadways in urbanized and rural areas are swept at least once per year. Material collected is properly disposed of at local landfills. Paved roadways in urban areas are swept approximately 2 times per year.

### Strategy

Street sweeping efforts help to remove fine particulate matter and other pollutants before being discharged into storm drain systems and downstream receiving waters.

### Staffing

Staffing for this BMP includes:

- UDOT Region Maintenance Area Supervisors and Station Supervisors
- UDOT Region Maintenance staff

## **BMP – Herbicide Application**

### Objective

Apply herbicides in such a manner to reduce to the maximum extent possible, the discharge of pollutants to adjacent areas, drainage facilities and receiving waters.

### Description

Maintenance forces selectively apply herbicides to roadside areas within the roadway right way to control undesirable plant species and invasive weed species listed on the Utah State Department of Agriculture's Noxious Weed List and each counties weed list.

### Strategy

The UDOT Maintenance Division implements a process that integrates the needs of local communities, visual quality, knowledge of wildlife and plant ecology and various economical methods to manage roadside vegetation. Healthy stands of vegetation resist invasion by noxious weeds, reduce the need for herbicide application and reduce maintenance costs. All personnel who apply herbicides receive approximately 20 hours of specialized training. This training includes the use of the various types of herbicides, calibration of equipment and field instruction. Trainees are supplied with handouts, instruction manuals and reference manuals. Every maintenance station is supplied with plant identification and weed management books. Applicators as well as other interested persons are encouraged to attend the annual Utah Weed Control Conference. UDOT's Roadside Vegetation Manager is continually evaluating the use and effectiveness of various herbicides. It was through this effort, that it was decided to discontinue the use of fertilizers throughout the department.

UDOT is a strong advocate of wildlife habitat preservation. UDOT supports a program called "Roadsides for Wildlife" which advocates leaving a strip of natural vegetation adjacent to the roadway. This program recommends leaving this strip of vegetation partially mowed or un-mowed. This has numerous benefits such as providing habitat for many bird species, reducing erosion and siltation and resisting invasion by noxious weeds. Native grasses, wildflowers and shrubs provide an aesthetically pleasing landscape and are important components of quality wildlife habitat.

### Staffing

Staffing and equipment resources are derived from:

- UDOT Central Roadside Vegetation Manager.
- UDOT Region Maintenance Area Supervisors and Station Supervisors
- UDOT Region Maintenance staff

## Appendix C: Agreements

- 26103

County Contract No. PV2041C  
D.A. No. 16-05392

**COPY**

AMENDMENT NO. 10 1

to

COOPERATIVE AGREEMENT 17-9701

between

UTAH DEPARTMENT OF TRANSPORTATION  
(Contract No. 938013)

and

SALT LAKE COUNTY  
(Contract No. PV2041C)

for

*For Stormwater UPDES Permit  
Water Quality Sampling Assistance*

\*\*\*

THIS AMENDMENT is made this 10<sup>th</sup> day of November, 2016, to that certain cooperative agreement (the "Agreement") dated August 24, 1992, between the UTAH DEPARTMENT OF TRANSPORTATION ("UDOT"), an agency of the State of Utah; and SALT LAKE COUNTY (the "COUNTY"), a body corporate and politic of the State of Utah.

#### RECITALS:

WHEREAS, the parties made the Agreement referenced above; and

WHEREAS, Paragraph 3 of the Agreement allows the parties to modify the Agreement to provide for changes or additions to the scope of work; and

WHEREAS, the parties amended the Agreement several times to provide for various additional tasks as needed by UDOT and agreed to by the parties; and

WHEREAS, the parties now desire to amend the Agreement one final time to provide for additional services and the necessary costs to complete such work, as set forth in this amendment; and

WHEREAS, the parties also desire to terminate the Agreement upon completion of the services described in this amendment;

#### AMENDMENT:

NOW THEREFORE, in consideration of the mutual covenants set forth herein, the parties agree to amend that certain Agreement, referenced above, as follows:

1. The COUNTY shall perform or cause to be performed all work necessary to

- TASK 1.1.4. Annual Stormwater Report: At the end of each Annual Report reporting period, the COUNTY will provide sampling information to UDOT to be incorporated in UDOT's Annual Report. This will include laboratory results, storm tracking spreadsheets and the sampling report (EMC calculations, Annual Load calculations, sampled storm event information, etc.).
- TASK 1.1.5. Annual Review: UDOT will participate in the County's annual review of the sampling plan and sample results.
- TASK 1.1.6. Sampling Plan Modifications: COUNTY will coordinate any proposed sampling plan modifications relating to sampling the JOR03 site with UDOT. The County will provide UDOT with a copy of the notification of such modifications submitted to DWQ. This will include notification to DWQ when samples are not collected at the UDOT site and the reasons for not sampling.
- TASK 1.1.7. Contract administration: COUNTY will prepare contract renewals as required; cost tracking, invoicing and accounting per terms of this agreement.
- TASK 2.0. PUBLIC INFORMATION AND EDUCATION PROGRAM
- TASK 2.1. Public Information and Education: COUNTY will develop implement and administer a Countywide public information and education (PIE) program. The program may consist of television, audio or radio commercials, newspaper inserts, web page development, video production, etc.. Individual program elements will be reviewed with UDOT before being implemented.

HANPDES\UDOT\2015\udot agreement sow

IN WITNESS WHEREOF, the parties execute this amendment as of the day and year first set forth above.

ATTEST:

UTAH DEPARTMENT OF TRANSPORTATION

\_\_\_\_\_  
By *[Signature]*  
Title \_\_\_\_\_

APPROVED:

\_\_\_\_\_  
*[Signature]*  
Director of Finance  
UDOT Contract Administrator

RECOMMENDED FOR APPROVAL

APPROVED AS TO FORM

\_\_\_\_\_  
*[Signature]*  
Region 2 Director

\_\_\_\_\_  
Assistant Attorney General

SALT LAKE COUNTY

By *[Signature]*  
Mayor or Designee

RECOMMENDED FOR APPROVAL

APPROVED AS TO FORM

\_\_\_\_\_  
*[Signature]*  
Director, Engineering Division  
Date 4 Mar 2016

\_\_\_\_\_  
*[Signature]*  
Deputy District Attorney  
Date 16 Aug 2016



SALT LAKE COUNTY ENGINEERING DIVISION  
 UPDES STORMWATER SAMPLING AND DATA WORK COSTS  
 2013, 2014, & 2015  
 UDOT CONTRACT PV2041C  
 WORK ORDER FV 924045, EHXX1007  
 STATION JOR03

Force Account		
	FV 924045/EHXX1007 1/1/13-12/31/13 - Staff	\$11,372.08
	EHXX1007 1/1/14-12/31/14 - Staff	\$2,450.02
	EHXX1007 1/1/15-12/31/15 - Staff	\$4,413.28
SUBTOTAL		<u>\$18,235.38</u>
Consultant		
	Stantec Consulting, Inc. Contract No. PV12119	
	2013	\$3,902.95
	2014	\$4,857.26
	2015	\$5,051.90
SUBTOTAL		<u>\$13,812.11</u>
Public Information/Education		
	By Contract	
	2013	\$5,000.00
	2014	\$5,000.00
	2015	\$5,000.00
SUBTOTAL		<u>\$15,000.00</u>
Laboratory		
	Chemtech-Ford Contract No. PV08136	
	2013	\$1,828.00
	2014	\$1,350.00
	2015	\$4,414.00
SUBTOTAL		<u>\$7,592.00</u>
Equipment/ Supplies 2015		<u>\$268.08</u>

Date	Action	Amount	Accrued	Balance	CONTRACT AMOUNT
07/24/92	Agreement	\$46,556.00		\$46,556.00	contract 07/24/92 \$46,556.00
12/31/92	Invoice #1	(\$19,734.75)	(\$19,734.75)	\$26,821.25	amend 1 12/12/94 \$62,004.90
12/31/93	Invoice #2	(\$14,716.68)	(\$34,451.43)	\$12,104.57	amend 2 04/07/97 \$33,974.49
05/25/94	Invoice #3	(\$7,895.47)	(\$42,346.90)	\$4,209.10	amend 3 02/10/99 \$36,524.30
12/12/94	Amendment #1	\$62,004.90		\$66,214.00	amend 4 04/25/01 \$30,612.45
12/31/94	Invoice #4	(\$12,291.67)	(\$54,638.57)	\$53,922.33	amend 5 05/12/04 \$21,074.62
12/31/95	Invoice #5	(\$12,527.96)	(\$67,166.53)	\$41,394.37	amend 6 02/25/05 \$20,523.12
12/31/96	Invoice #6	(\$19,368.86)	(\$86,535.39)	\$22,025.51	amend 7 01/31/2007 \$45,505.31
04/07/97	Amendment #2	\$33,974.49		\$56,000.00	amend 8 6/1/2009 \$36,055.79
12/31/97	Invoice #7	(\$20,386.50)	(\$106,921.89)	\$35,613.50	amend 9 6/1/2013 \$80,219.61
12/31/98	Invoice #8	(\$22,137.80)	(\$129,059.69)	\$13,475.70	amend 10 2/3/2016 \$40,907.57
02/10/99	Amendment #3	\$36,524.30		\$50,000.00	(final)
01/21/00	Invoice #9	(\$14,540.65)	(\$143,600.34)	\$35,459.35	
03/22/01	Invoice #10	(\$22,071.80)	(\$165,672.14)	\$13,387.55	
04/25/01	Amendment #4	\$30,612.45		\$44,000.00	
01/11/02	Invoice #11	(\$15,057.26)	(\$180,729.40)	\$28,942.74	
01/28/03	Invoice #12	(\$14,617.36)	(\$195,346.76)	\$14,325.38	
05/12/03	Amendment #5	\$21,074.62		\$35,400.00	agreement TOTAL \$453,958.16
01/27/04	Invoice #13	(\$13,275.93)	(\$208,622.69)	\$22,124.07	
01/10/05	Invoice #14	(\$11,247.19)	(\$219,869.88)	\$10,876.88	
02/25/05	Amendment #6	\$20,523.12		\$31,400.00	
01/10/06	Invoice #15	(\$17,141.75)	(\$237,011.63)	\$14,258.25	
01/04/06	Invoice #16	(\$27,763.56)	(\$264,775.19)	(\$13,505.31)	
01/31/07	Amendment #7	\$45,505.31		\$32,000.00	
03/06/08	Invoice #17	(\$13,483.14)	(\$278,258.33)	\$18,516.86	
02/22/09	Invoice #18	(\$22,572.65)	(\$300,830.98)	(\$4,055.79)	
06/09/09	Amendment #8	\$36,055.79		\$32,000.00	
02/01/10	Invoice #19	(\$24,481.09)	(\$325,312.07)	\$7,518.91	
6/1/2013	Invoice #20	(\$51,738.52)	(\$377,050.59)	(\$44,219.61)	
6/1/2013	Amendment #9	\$80,219.61		\$36,000.00	
2/3/2016	Invoice #21	(\$54,907.57)	(\$431,958.16)	(\$18,907.57)	
2/3/2016	Amendment #10	\$40,907.57		\$22,000.00	
	Final-new contract				

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