2016 ANNUAL REPORT
APDES Permit No. AKS-052558

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Submitted by:
Municipality of Anchorage

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Acronyms

AK-CESL	Certified Erosion and Sediment Control Lead
ADEC	Alaska Department of Environmental Conservation
AMC	Anchorage Municipal Code
APDES	Alaska Pollutant Discharge Elimination System
ADOT&PF/DOT	Alaska Department of Transportation and Public Facilities
ARDSA	Anchorage Road and Drainage Service Area
AWC	Anchorages Waterways Council
BMP	Best Management Practice
CBERRSA	Chugiak Birchwood Eagle River Rural Road Service Area
CGP	Construction General Permit
CO	Certificate of Occupancy
DCM	Design Criteria Manual
EPA	Environmental Protection Agency
ESCP	Erosion Sediment Control Plan
FHWA	Federal Highway Administration
GIS	Geographic Information System
GPS	Global positioning system
HMCP	Hazardous Material Control Plan
HGDB	Hydrogeodatabase
LID	Low Impact Development
M&O	ADOT&PF Central Region Division Maintenance and Operation
MASS	Municipality of Anchorage Standard Specifications
MEP	Maximum Extent Practicable
MOA	Municipality of Anchorage
MS4	Municipal Separate Storm Sewer System
MS4GDB	MS4 Geodatabase
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OGS	Oil and Grit or Oil and Grease Separator
ROW	Municipal Rights of Way
SOP	Standard Operating Procedures

SWPPP	Storm Water Pollution Prevention Plan
SWTPRGM	Storm Water Treatment Plan Review Guidance Manual
WMS	Watershed Management Services

Introduction

The Municipality of Anchorage (MOA) and the State of Alaska, Department of Transportation and Public Facilities (ADOT&PF), submit this Report in fulfillment of the annual reporting requirements of Alaska Pollutant Discharge Elimination System (APDES) Permit No. AKS 05255-8, *"Authorization to Discharge Under the National Pollutant Discharge Elimination System"* (Permit), effective date August 1, 2015. This report satisfies the criteria set forth in Permit Section 4.4 and is organized by program to demonstrate compliance with the *"Storm Water Management Plan"* developed to meet the requirements laid out in Permit Section 2. Documents produced in compliance with this Report are included in associated Appendices A through H.

The permittees responsibilities are both joint and individual; they are laid out in their Inter-jurisdictional Agreement describing their respective roles and responsibilities related to this Permit. Coordination between groups within the permittees organizations are laid out in their Program Coordination Plans.

Responsibilities for certain requirements have been shared with the Anchorage Waterways Council (AWC). The delegated activities are in the areas of Public Education for General Audiences located in Permit Part 3.6, Watershed Planning located in Permit Part 2.7, and program evaluation of Animal Facilities, located in Part 3.3.3.

1. Program Organization

1.1 Storm Water Management Plan

The actions and activities of the Anchorage MS4 program have been documented in its Storm Water Management Plan (SWMP). The SWMP is intended to reduce the discharge of pollutants from the MS4 into receiving waters to the maximum extent practicable (MEP). The permittees have identified the prescribed best management practices (BMP) including control measures, system design, engineering methods, and other provisions appropriate to the control and minimization of pollutants and addressed the Permit requirements as described in Sections 3 and 4 of the Permit.

The annual reports document the compliance measures taken during the year in fulfillment of the SWMP. Both documents are laid out consistent with Sections 3 and 4 of the Permit. Activities are identified in their appropriate program summaries along with results of information collected, summaries of activities, and appendix references and web-links to associated supporting materials. Also, in each program section are self-assessments of performance and summaries of planned activities for future reporting cycles.

The SWMP has been updated based on 2016 information and is provided in Appendix A1.

Program Effectiveness

The permittees believe all Permit requirements due in the first eighteen months were met on schedule. Activities were carried forward from the second term permit which was in administrative extension until August 2015. The reporting date for the 2016 Annual Report fell in the fifth month of the second year of the new permit. The Permittees accomplished the work required for submittal with the second annual report and some of the activities required by the end of the second year which ends in July 2017. The remaining activities due the second year will be reported in the 2017annual report.

Each of the monitoring program reports presented with this submittal provides a detailed presentation of results from the current monitoring year. These reports indicate what follow-up actions need to be taken as a result of the program findings.

The Quality Assurance Plan (QAP) and monitoring plans have been updated to reflect minor changes based on observations by monitoring teams to better capture targeted information. For example, prior to the 2016 monitoring season, one stormwater outfall site was exchanged for a nearby site in order to eliminate the influence of ground water on the storm discharge results. Also, in order to identify sources of wet weather flows that have above threshold pollutant levels a new notification process was implemented to give the Permittees timely information to help identify possible sources.

Pollutant load allocations, in the form of total maximum daily loads (TMDL), are assigned by the State to a number of creeks and lakes in Anchorage based on the State's *Primary Use* designation as drinking water sources. Dry and wet weather screening provides indicators of bacterial impacts from storm water to identified receiving systems. In addition to follow-up field investigations, the permittees are continuing to provide public education about pet waste management, with the Scoop the Poop message. They are also participating in renewed efforts to manage waterfowl populations and resulting water quality impacts.

A substantial change to street sweeping assessment activities was implemented in 2016 to assist with improving sweeping operations. In the past, monitoring was performed over the course of the season with a resulting summary report reflecting all practices. During this term, assessment provides real-time qualitative feedback to help operators adjust practices for development of a visually clean standard.

The operations of the storm sewer system were implemented by primary coordinating groups. Coordination is managed through agreements between Municipal Watershed Management Services (WMS) and each of the participating MS4 operators; these were updated in the nine-month submittal. The M&O operators have provided 2016 MS4 Summaries for their areas of permit compliance. Those with updates are provided in Appendix A2.

Program Resources

The permittees have broken their program costs into two functional categories: Operations & Maintenance (O&M) and Program Management/Project Administration. The maintenance costs are summarized from the program breakdowns contained in the MS4 Summaries. The 2016 costs are presented in Table 1.1

1: Table 1.1 – 2016 SWMP Program Costs

	ADOT&PF	Municipality	CBERRSA	GRSA	Total
Maintenance & Operations	$2.3M	$2.5M	$0.73M	$0.49M	$5.5M
Program Management/ Administration	$0.38M	1.0M	-	-	$1.4M
	$2.7M	$2.5M	$0.7M	$.49M	$6.9M

1.2 Watershed Planning

The permittees are required to evaluate two existing watershed plans before the end of the fourth term of the Permit. The *Little Campbell Creek Watershed Plan* and the *Chester Creek Watershed Plan* were developed under the guidance of working groups composed of diverse agency interests and supported by staff from Watershed Management Services (WMS), U.S. Fish and Wildlife Service, and the Anchorage Waterways Council. The reports are available on the WMS website at http://anchoragestormwater.com/watershedplanning.html.

The MOA began the plan evaluations for both watersheds in 2016. They are discussed in the Anchorage Waterways Council (AWC) summary report presented in Section 7.

The permittees are also required to complete a scoping document for one individual watershed plan for a specific water body prior to the expiration of the permit. The scoping document must identify whether activities carried out in the watershed are beneficial in accomplishing site-based LID practices and recommend future actions to obtain identified goals. The scoping document will be used to determine if a watershed plan will be developed in the next permit cycle. In 2016 a scoping meeting was held with interested members of the community. This group discussed a number of watersheds for potential focus, and ultimately selected Campbell Creek to develop into a scoping document. The scoping meeting is discussed in the AWC summary report.

2 Construction Site Management

2.1 Regulatory Mechanism and Standards

Ordinance and/or Regulatory Mechanism

ADOT&PF Projects. ADOT&PF regulates stormwater management of their highway and aviation construction projects through its Statewide and Central Region Standard Specification Section 641 Erosion, Sediment and Pollution Control for Highway Construction and Item P-157 for Erosion, Sediment and Pollution Control for Airport Construction. ADOT&PF revised the Section 641 and Item P-157 Statewide and Regional Specification in 2016 because of:

- The US Environmental Protection Agency (EPA) terminated the ADOT&PF Consent Decree, therefore ADOT&PF removed Consent Decree language references from the specifications and modified the attendant requirements;
- The Department of Environmental Conservation (ADEC) issued a new Alaska Construction General Permit (2016 ACGP) under the APDES; ADOT&PF updated the specification to reflect changes from the 2011 ACGP.

The Statewide and Central Region specifications were updated separately in 2016 due to the Statewide specifications needing a higher level of regulatory approval before an update could be issued. The Central Region Section 641 and P-157 specifications were revised to take effect on February 1, 2016, when the 2106 ACGP was issued. The Central Region Section 641 specification was further modified on August 23, 2016. The Central Region updates were incorporated into active project specifications by change order to ensure permit compliance after issuance of the 2016 ACGP.

The Statewide specifications were required to obtain approval from federal regulatory agencies prior to being updated. The Section P-157 specification received Federal Aviation Authority (FAA) approval on

March 2, 2016, and the Section 641 specification received Federal Highway Authority (FHWA) approval on November 10, 2016.

The SWPPP construction forms provided by the ADOT&PF, and contractually required to be used to document permit compliance, were modified and made available for use on February 2, 2016.

These stormwater specifications are contractually enforced. ADOT&PF provides guidance on contract stormwater administration to its project staff through two mechanisms, the Alaska Construction Manual, Chapter 3 & 9.9, and by having two stormwater specialists dedicated solely to stormwater guidance and education. This manual was last updated on July 7, 2014 and outlines procedures for implementing and monitoring construction SWPPPs. Modifications to the Alaska Construction Manual, reflecting the new requirements in the 2016 ACPG and eliminating language associated with the terminated EPA Consent Decree were completed in 2016. The Alaska Construction Manual will be updated upon obtaining the necessary final approvals from federal regulatory agencies.

Highway Standard Modification for Section 641 and Item P-157 for Airports, Erosion, Sedimentation and Pollution Control link:

http://www.dot.state.ak.us/stwddes/dcspubs/directives.shtml

ADOT&PF Construction Forms Link:

http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml

Alaska Construction Manual link:

Private Development. The Municipality regulates stormwater management at private construction sites through Anchorage Municipal Code (AMC) Title 21. The Municipal ordinance 2010-81, adopted on December 7, 2010, amended Title 21 to require a permit, entailing plan review and approval, for ground disturbing activities. This ordinance added a new section, AMC 21.67.09, to municipal code. The re-write of Title 21, effective January 1, 2014, carried this permit language forward. It can be found in AMC 21.07.04.E,.. This code is available at: https://www.municode.com/library/ak/anchorage/codes/code_of_ordinances?nodeId=TIT21LAUSPLNECOFFJA12014_CH21.07DEDESTNECOFFJA12014_21.07.040DRSTWATRERCOPRDI.

Municipal Projects. The Municipality regulates stormwater management during construction of its own (public) projects through Municipality of Anchorage Standard Specifications (MASS), Division 20 (MASS Section 20.02). These standard specifications are contractually enforced. In 2012, MASS Section 20.02 was updated to incorporate requirements of Alaska's 2011 Construction General Permit. A link to the MASS is found at http://www.muni.org/Departments/works/project_management/Pages/MASS.aspx.

Construction Storm Water Manual

ADOT&PF revised its Alaska Storm Water Pollution Prevention Plan (SWPPP) Guide in December 2015. ADOT&PF updated the Alaska SWPPP Guide Appendix B, BMP Guide to reflect emerging technologies and practices for 53 new BMP details and descriptions, and 6 M&O and Good Housekeeping descriptions. Revisions to the main body of the Alaska SWPPP Guide, modifications to incorporate the changes to the 2016 ACGP, are in the final stages of approval to allow an update.

Alaska SWPPP Guide Link:

http://dot.alaska.gov/stwddes/desenviron/assets/pdf/bmp/bmp_guide_preamble.pdf

http://dot.alaska.gov/stwddes/desenviron/assets/pdf/bmp/bmp_all.pdf

http://dot.alaska.gov/stwddes/desenviron/assets/pdf/bmp/mo_bmp.pdf

Private and Municipal Projects. The Municipality has updated its Storm Water Plan Review and Treatment Guidance Manual (SWTPRGM) to reflect the regulatory program based on the Term III APDES permit and the update to the 2016 Alaska Construction General Permit. It is incorporated as Volume 2 of the Anchorage Stormwater Manual currently under review by the Anchorage Planning and Zoning Commission. It is available at www.anchoragestormwater.net.

Previously, the SWTPRGM was updated in 2010, to reflect the 2011 Alaska Construction General Permit and to include new items, such as a requirement for submittal of record drawings (as-builts) and to specify new inspection requirements.

2.2 Plan Review and Approval

ADOT&PF Projects. During 2016, ADOT&PF reviewed and approved SWPPPs for 8 projects needing an NOI in the Municipality of Anchorage. An additional 16 projects were carried over from the 2015 construction season. All 16 holdover projects were required to update the project SWPPP and associated specification to comply with the 2016 ACGP. All 24 projects were contracted and administered by ADOT&PF. A list is provided in Appendix B1. ADOT&PF is a co-operator on these projects with the Construction Contractor performing the work. After construction activities begin, most ADOT&PF active projects are subject to a documentation review performed by a Central Region Stormwater Specialist. This review is based on the EPA Appendix R NPDES Industrial Storm Water Investigation and Case Development Worksheet.

Private and Municipal Projects. The WMS continues to review construction SWPPPs for projects conducting ground disturbance greater than 10,000 square feet. The types of projects reviewed include any work requiring a building permit, utility work, new subdivisions and road projects. In 2011, WMS began regulatory review of all Municipal projects 1 acre and greater. The reviews encompass construction erosion control measures and permanent stormwater management practices.

In 2016, WMS reviewed and approved approximately 272 Residential permits and 133 commercial buildings, and a number of commercial and government building additions. WMS also conducted Storm Water Pollution Prevention Plan reviews of 15 Municipal Projects.

The Municipal Development Services Division implemented a computer-based building permit administration system to track and document plan reviews and approvals in 2010. WMS continues to pursue applicable program updates in compliance with conditions of the Permit. Refer to Section 3.4.3 of this report for information regarding these updates.

2.3 Construction Site Inspections and Enforcement

2.3.1 Inspection and Enforcement Tracking

ADOT&PF Projects. A summary of inspection activities shows the ADOT&PF conducted 436 site inspections on 24 projects within the Municipality of Anchorage. ADOT&PF performed:

- 343 site inspections on 17 highway projects ranging from major highway realignment to repaving arterial roads
- 93 site inspections on seven airport projects for the Ted Stevens Anchorage International Airport including major runway reconstruction, drainage projects, and facility support projects

For each of these inspections, ADOT&PF reviewed the SWPPP or other site documentation and performed a physical inspection of the site to confirm there were no illicit discharges or incidences of permit noncompliance. At the conclusion of the visit, ADOT&PF prepared an inspection report and included the report in the SWPPP. Any required corrections were given to the site representative. In 2016, no stop work orders were given on any ADOT&PF construction project within the Municipality of Anchorage. The records for site inspections along with associated compliance follow-up are available for review at individual project offices.

Municipal: A summary of inspection activities reveals that 358 commercial site inspections and 492 residential site inspections were conducted during 2016 including 11 construction related inspections from the illicit discharge reporting website located at: http://www.muni.org/Departments/OCPD/development/BSD/Pages/CodeEnforcement.aspx For each of these inspections the SWPPP or other site documentation was reviewed and a physical inspection of the site was performed to confirm there were no illicit discharges. At the conclusion of the visit an inspection report of findings and any required corrections were given to the site representative. Where corrections were indicated a re-inspection was scheduled to confirm compliance. When compliance isn't achieved within the specified period of time a stop work order is issued until compliance is achieved. In 2016 no stop work orders were given. The records for site inspections along with associated compliance follow-up are available for review at WMS.

2.3.2 Enforcement Response Policy

ADOT&PF: ADOT&PF's Enforcement Response Policy is contained in the following documents:

- Alaska Construction Manual, Chapter 9.9 SWPPP & HMCP Implementation and Monitoring, modified in 2016 and awaiting final approval for update from federal regulatory agencies
- Standard Specification Item 641 Erosion, Sediment and Pollution Control for Highway Construction, Section 641-3.04 Failure to Perform Work; Central Region specification updated on February 2, 2016, Statewide specification updated on November 11, 2016
- Item P-157 for Erosion, Sediment and Pollution Control Airport Construction, Section 157-3.4 Failure to Perform Work; Central Region specification updated on February 2, 2016, Statewide specification updated on March 2, 2016

The Alaska Construction Manual spells out the inspector qualifications and duties, non-compliance reporting and monitoring paperwork. The standard specifications provide project and administration requirements relating to control of erosion, sedimentation, and discharge of pollutants. The work must follow applicable local, state, and federal requirements, including the CGP and the MS4 Permit. The standard specifications are contractually enforced.

These specifications authorize ADOT&PF personnel to verbally warn and provide written notices to the construction after each inspection. The SWPPP Construction Inspection Report and the Corrective Action Log document the timely maintenance or corrective actions required. ADOT&PF revised the Section 641 and Item P-157 Statewide and Regional Specifications in 2016 because of:

- EPA terminated the ADOT&PF Consent Decree; ADOT&PF removed Consent Decree language references from the specifications and modified the attendant requirements
- ADEC issued a new 2016 ACGP; ADOT&PF updated the specifications to reflect changes from the 2011 ACGP

Escalation enforcement measures include:

- Orally suspending the work if the suspension is to protect workers, the public or the environment from imminent harm
- Written suspension of work explaining the defects, reasons, corrective actions and time allowed to complete the corrective actions
- Withhold monies from the construction contractor until corrective actions is completed
- Assess damages or equitable adjustments against the contract amount
- Employ others to perform the corrective action and deduct the costs from the Contract amount

Alaska Construction Manual link:

http://www.dot.state.ak.us/stwddes/dcsconst/pop_constman.shtml

Highway Standard Modification for Section 641 and Item P-157 for Airports, Erosion, Sedimentation and Pollution Control link:

http://www.dot.state.ak.us/stwddes/dcspubs/directives.shtml

Municipal. The Municipality updated its escalating enforcement policy and provided it with the 2011 annual report, in advance of the required second year of this term Permit.

2.3.3 Construction General Permit Violation Referrals

ADOT&PF. ADOT&PF provides guidance to its project staff on reporting noncompliance in the Alaska Construction Manual, Chapter 9.9. In 2016, ADOT&PF filed six non-compliant discharge reports to the ADEC on their projects within the Municipality of Anchorage. Four discharges were reported for ADOT&PF Project No. 59190 – AMATS: Abbott Rd. Rehab Phase I; one discharge was reported for ADOT&PF Project No. 57590 – ANC Taxiway R Improvements & ANC Taxiway T Improvements; one discharge was reported for ADOT&PF Project No. 58526 – Alyeska Hwy Resurfacing: Seward Hwy to Arlberg Ave & Alyeska Hwy: Pathway Rehab (GF)

Municipal. The permit requires the Municipality to report to ADEC when they find projects which failed to comply with the Construction General Permit prior to breaking ground. In 2016, MOA did not file any reports of non-compliance to the ADEC.

2.4 Construction Program Education and Training

During the Permit's second term, agreement was reached by agencies and interest groups for a standardized training course targeted for construction site owners and operators and their key personnel. In 2012, the Memorandum of Understanding to establish Certified Erosion and Sediment Control Leads in Alaska (AK-CESCL) was updated by eight governing members comprised of the Alaska Department of Environmental Conservation, the Alaska Department of Natural Resources, ADOT&PF, the Alaska Railroad Corporation, the Associated General Contractors, the Municipality, the US Army Corp of Engineers, and the Associated Builders and Contractors Alaska. The original agreement, training requirements, and course elements for the AK-CESCL program were provided in the 2010 Annual Report. The updated agreement, provided in the 2013 Annual Report, made some minor revisions to clarify the procedures of the training program. In 2015, the Alaska Storm Water Steering Committee approved a one-day eight-hour Refresher Course to satisfy the Alaska Certified Erosion Sediment Control Lead (AK-CESCL) renewal requirements. To be eligible to take this training, you must have an active AK-CESCL number and taken the two-day (16-

hour) class or Refresher class within the last three years. Applicants will have a (90 grace period until June 1, 2016)

This course is a summary of the two-day initial AK-CESCL class. It thoroughly examines erosion and sediment pollution control concepts and design procedures as they apply to construction projects. The Refresher Course is a training and certification program to comply with the ADEC CGP and the Municipality's SWTPRGM. The Refresher Course will stress risk management, review proper best management practices, and provide guidance. Upon passing the 8-hour refresher course, the applicant will be granted an AK-CESCL certificate. Applicants not passing the (8-hour) refresher course will be required to retake the two-day (16-hour) class.

ADOT&PF. ADOT&PF participated in the following trainings:

- AK CESCL Course: Alaska Certified Erosion and Sediment Control Lead is a two day, 16 hour course. This program requires recertification every 3 years. 25 participants were enrolled in the course held on May 11-12, 2016.
- AK CESCL Refresher Course: Alaska Certified Erosion and Sediment Control Lead Refresher Course is a 1 day, eight hour course. This program requires recertification every 3 years. 28 participants were enrolled in the course held on March 23, 2016.
- AK CESCL: The Central Region ADOT&PF sponsored AK CESCL classes are taught by Mary Cunningham and Joshua James, ADOT&PF Central Region Stormwater Specialists.
- ADOT&PF Statewide Annual Stormwater Field Review: ADOT&PF hired a consultant to work with key staff from the ADOT&PF Regions and Headquarters to review and evaluate our compliance program through a hands-on field audit an active project site in the Northern Region. Fourteen ADOT&PF staff and contractors attended this field review in June 2016. After the review, we presented recommendations in the regional office for design engineers, construction managers, maintenance and environmental staff. The field review was conducted on June 23. Mary Cunningham and Joshua James, ADOT&PF Central Region Stormwater Specialists attended.

Municipality. The Municipality conducted or participated in the following training:

- 2016 Watershed Update/APDES Annual Meeting: 3-1-2016. This half-day meeting reviewed the findings of monitoring, assessments, mapping, and new programs associated with the permit. It was attended by members of all participating MOA departments.
- Storm Water Solutions, Picking Structural Best Management Practices for Treating Storm Water: Sediment Oil & Grease, and Metals Removals, November 9, 2016

3 Storm Water Management for Areas of New and Redevelopment

3.1 Regulatory Mechanisms and Standards

3.1.1 Ordinance and/or Regulatory Mechanism

ADOT&PF. ADOT&PF regulates project development through the Alaska Highway Preconstruction Manual and Alaska Aviation Preconstruction Manual. Both manuals require ADOT&PF to comply with local ordinances. Therefore, all projects within the Municipality of Anchorage follow the Municipal Design Criteria Manual (DCM).

Alaska Highway Preconstruction Manual link:

http://www.dot.state.ak.us/stwddes/dcsprecon/preconmanual.shtml

Alaska Aviation Preconstruction Manual link:

http://www.dot.state.ak.us/stwddes/dcsprecon/pop_aviation_preconstman.shtml

Municipal Projects. The Municipality regulates permanent stormwater controls on its own projects through the Municipal Design Criteria Manual (DCM). The DCM has been updated by a committee of local of community experts to guide better drainage management and to reflect the goals of Permit, as discussed in Section 3.1.2. The 5-year Implementation Plan created for this term will guide the Municipality through the transition to their new design criteria.

Private Projects. The Municipality regulates permanent stormwater controls through the Anchorage Municipal Code Title 21, which refers to the DCM for policy and technical details. The DCM is discussed in the following section.

3.1.2 Storm Water Design Criteria Manual

ADOT&PF Projects. Effective August 1, 2016, it is the policy of DOT&PF Central Region to apply the guidance contained within the latest approved version of the Municipality of Anchorage, Anchorage Stormwater Manual to projects located within the boundaries of the Municipality of Anchorage with the following exceptions:

- DOT&PF will be conducting all required management and reporting for its projects internally.
- Section 1.6 Drainage Variances – Replace with the following: Approval from the Preconstruction Engineer is required for all variances from the drainage design requirements.
- Section 3.3.2 Stormwater Management Report Components – Add the following at the end of the first paragraph: The Stormwater Management Report shall also meet the requirements of the Highway Preconstruction Manual 1120.5.6 Hydrologic and Hydraulic Reports when applicable.

Private and Municipal Projects. The Municipality establishes design criteria for permanent stormwater controls through Chapter 2 of its Design Criteria Manual (DCM), which is referenced from AMC Title 21. This manual has been updated to reflect current regulations and stormwater management practices; it may be found on the Municipal website, www.anchoragestormwater.com .

The DCM has been revised through a process that incorporates Permit requirements and community input. The Municipality referred the new draft DCM to the Anchorage Planning and Zoning Commission for review and recommendation for adoption by the Assembly. There will be an adoption period of choice between the old and new DCM to give the development community time to adjust to the new requirements consistent with the *Low Impact Development Implementation Plan*. However, we are finding most designers are requesting the new manual.

The Low Impact Development Implementation Plan Update (Appendix C2) for the new design criteria and stormwater manual lays out a schedule and strategy for moving forward with demonstration projects and new criteria for incorporating LID into linear and vertical projects throughout Anchorage. It moves the Permittees from struggles experienced with the retention requirement in the previous permit term toward solutions in the form of detention and water quality treatment through LID/Green Infrastructure in this permit term.

3.2 Green Infrastructure/LID Strategy and Demonstration Projects

3.2.1 LID Incentives Strategy

The Municipality continues to sponsor an incentive program for rain gardens and Low Impact Development (LID) projects supported by a grant from the United States Fish and Wildlife Service. This program continued to support all types of vegetated Low Impact Development (LID) techniques and offer a larger financial incentive for bigger and more varied rain garden projects; rain gardens with contributing areas greater than 2,000sqft qualify for a reimbursement of up to $5,000. In 2016, the program supported the construction of 5 new rain garden and LID projects in Anchorage. Incentive support includes, but is not limited to, technical guidance, manuals, brochures, websites, tours, financial cost sharing, hands-on workshops, private consultations, ongoing classroom support for school projects, and ongoing maintenance for public rain gardens.

The 14,465 square feet of rain gardens and LID incentivized through the program in 2016 capture and treat runoff from roughly 93,600 square feet of impervious surface. For a single half inch rain event, these features would capture and treat over 29,000 gallons of storm water throughout the Municipality, relieving a slight amount of pressure from the MS4.

A map and more details on the constructed rain gardens can be found in Figure 4.1 and Table 4.1 below.

3.2.2 Demonstration projects

The ADOT&PF and the Municipality intend to construct five projects as required by Part 3.2.3 of the Permit for incorporation of LID. The new projects will be evaluated for hydrologic performance and information will be used to update LID design criteria.

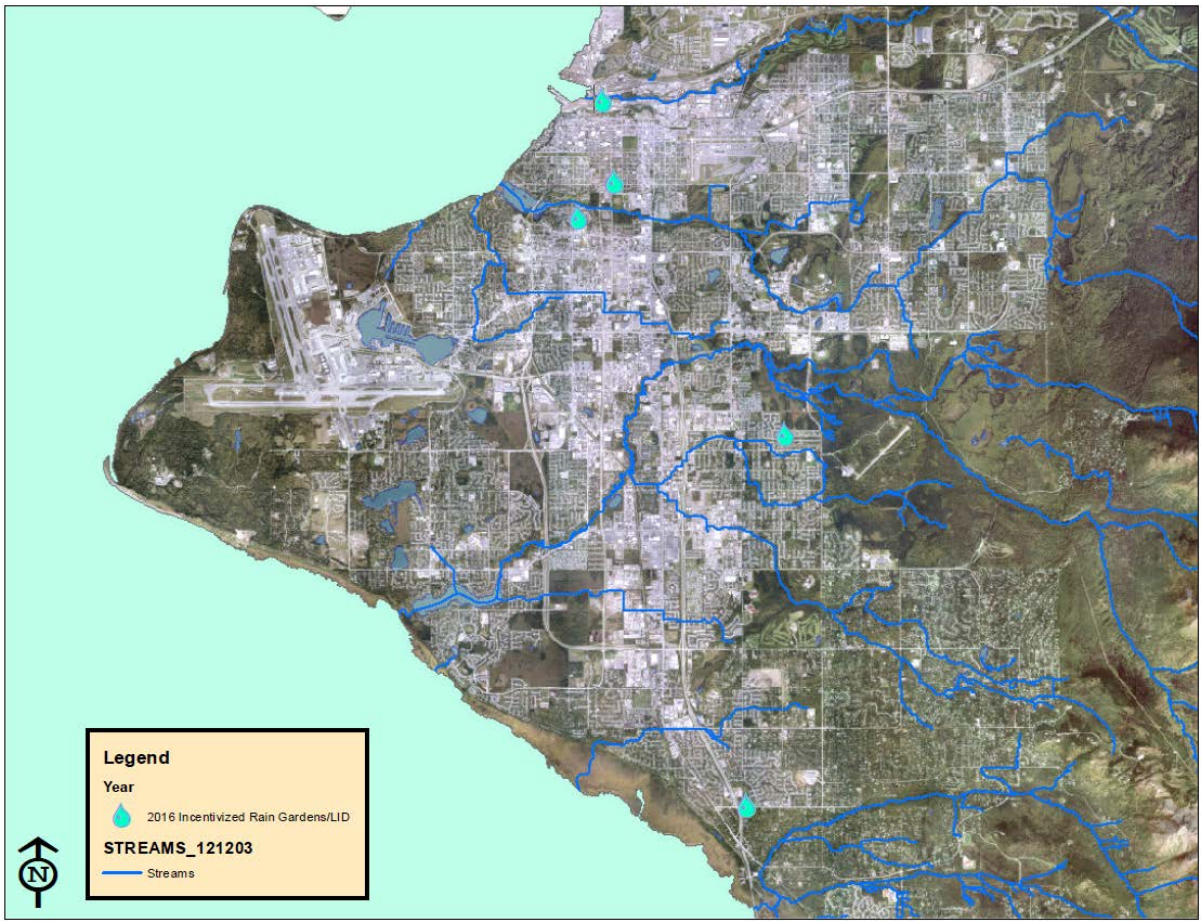
ADOT&PF Projects. ADOT&PF Central Region Design Section has identified the following three LID demonstration projects: 1) West Dowling Extension Phase III, New Seward Highway Improvements Phase II: O'Malley Road Reconstruction, Phase I, New Seward to Livingston; 3) Jewel Lake Road Widening, 88th Ave to Strawberry St. These projects have been selected for hydrologic performance evaluation based on project construction schedules and readiness for monitoring.

Municipal Projects. The Municipality of Anchorage has completed a number of qualifying LID demonstration projects during the third term of the Permit. LID improvements were completed in 2016. These improvements include grass pavers, bio-swales, and an engineered bio-filtration basin. This new fire station is located in Rabbit Creek Watershed. In the Ship Creek Watershed, two LID projects were completed during 2016. As part of the King's Landing Ship Creek Project, a rain garden was constructed that intercepts runoff from paved surfaces that would otherwise flow to Ship Creek. As part of the second project, a system of new, engineered bio-swales were constructed along the grassed slope below 3rd Avenue. These serve to divert and treat a portion of the piped, urban stormwater runoff from the 3rd Ave. and E Street area. Lastly, an underground infiltration gallery was constructed within the West Dimond Avenue Right-of-Way. A second infiltration gallery project was started in 2016 to treat runoff in the Folker/48th Avenue area. This project, which retrofits a direct stormwater flow to Campbell Creek, will be completed in 2017. A number of projects are tentatively planned to begin during the 2017 construction season. This include new LID projects are being considered to address drainage and potential water quality concerns at Cuddy Midtown Park and Valley of the Moon Park.

All new projects will be evaluated for changes in runoff quantities starting in 2017. Evaluation for existing LID projects continued this year as part of the Implementation Plan discussed in Part 3.1.2. The report is

provided in Appendix C1. Projects constructed as a part of the LID program are being monitored over time to watch for maintenance needs, and overall performance.

2: Figure 3.1: Map of Rain Gardens Constructed in 2016



3: Table 3.1 – Rain Gardens Incentivized in 2016

Type (Commercial, Residential)	Project Name	Impervious Contributing Area (sqft)	Final Garden Size (sqft)	In-kind Labor (hr)	Reimbursement	In-Kind Materials ($)	Total Garden Cost
R	Residential	1500	315	135	$750.00	$1,824.36	$2,574.36
R	Residential	2500	100	4	$541.63	$541.64	$1,083.27
C	16CentralLutheranRG	41000	3000	1000	$5,000.00	$5,026.86	$10,026.86
C	16FireStation9	35000	8000	0	$20,000.00	$47,000.00	$67,000.00
C	16KingsLanding	13600	3050	0	$25,716.59	$54,283.41	$80,000.00
Total	**5 Rain Gardens/LID**	**93600**	**14465**	**1139**	**$52,008.22**	**$108,676.27**	**$160,684.49**

3.2.3 Rain Gardens

The Permittees are required to quantitatively evaluate the effectiveness of select raingardens by the fourth year of the Permit. This requirement will be met through revisiting projects constructed in the second term of the permit. There were two rain gardens, both located within TMDL watersheds. One is located in Taku Park, part of the Campbell Creek watershed, capturing the parking lot runoff and adjacent road runoff from the bordering commercial neighborhood. The other is located at the Fisherman's Bank on Spenard Road, constructed through public-private partnership, in the Fish Creek watershed. These will be quantitatively re-evaluated with the results to be included in the LID Monitoring Report discussed in Section 3.2.2.

Other rain gardens were constructed in neighborhoods around Anchorage as part of the LID incentives program discussed in Section 3.2.1. Still others were constructed as part of private developments and identified through the LID/Green Infrastructure Working Group. In the interest of developing a performance record for various types of controls, private projects will be tracked/monitored as discussed in the Implementation Plan described in Section 3.1.2.

3.2.4 Riparian Zone Management

During the current permit the permitees are required to disconnect at least one MS4 outfall from discharging to receiving waters. During the fall of 2015, the MOA completed work on disconnecting one stormwater outfall in the Campbell Creek Watershed. The outfall drains Subbasin 1221 and is categorized as a major outfall as it receives stormwater flows from an area larger than 50 acres that is comprised entirely of industrial areas. Formerly, this subbasin drained to a single outfall located near the intersection of the Old Seward Highway and International Airport Road. As part of the project, subbasin flows were split, resulting into two new subbasins. One basin drains to the location of the original outfall and a second outfall was added in the 56th Avenue Right of Way, west of the Old Seward Highway. Both new outfalls convey stormwater to Campbell Creek via a swale after it has been treated in two, new oil and grit separators.

3.2.5 Street and Parking Lot Repair

ADOT&PF. In general the Department has few opportunities to repair or reconstruct parking areas. However, the ADOT&PF is implementing LID measures where possible in their projects. The Design sections are including LID practices into projects currently in design and also working to establish direction and guidelines on using LID on all projects where it is feasible.

. These LID measures include:

a. Soil Amendments - Spreading a layer of topsoil, compost or mulch on disturbed areas and then placing seed or sod.
b. Bioretention – Planting soil and plant-based filtration devices that remove pollutants through a variety of physical, biological, and chemical treatment processes.
c. Reverse Sidewalk Slopes – Sloping sidewalks to drain away from the road and into adjacent vegetated areas.
d. Dispersion – Channelizing (collecting and re-dispersing) stormwater into areas with either native vegetation or cleared land in areas outside of urban growth areas that do not have a natural or man-made drainage systems.

For example, in support of the MS4 Permit and the Green Roads initiative the AMATS: O'Malley Road Reconstruction Phase I project proposes a linear landscape drainage design that will aid in the infiltration, evaporation, and decontamination of the storm water runoff. Prior to discharging storm water into the right-

of-way at the wetlands of Moose Meadows or the bioswale at the Seward Highway; runoff will be treated by the filtration and infiltration of grassy ditches. Silt deposits and debris will be settled out in the sumps of the storm drain system and rock lined ditches will filter and dissipate the water. At Moose Meadows the rock lined ditches will disperse the flow before entering the wetlands where the natural vegetation will further decontaminate the runoff and allow for infiltration and evaporation of the remaining water. At the Seward Highway a landscaped bioswale is proposed to filter off silts and contaminations through compost socks and will allow up to a half-foot of standing water for evaporation and infiltration. The wide and shallow ditch is intended to maximize the time water spends in the swale before it is discharged and conveyed into a series of culverts and grassy ditches prior to merging into the existing Old Seward Highway and O'Malley Road storm drain system.

Municipality. In 2016, the Municipality of Anchorage continued to evaluate the feasibility of incorporating rainfall runoff techniques in the repair and construction of public roads, streets, and parking lots.

As discussed in the 2015 Annual Report, within its transportation construction program, the MOA continues to focus on rehabilitation of existing roadways rather than re-construction of existing roads and the construction of new roads. As previously outlined in Section 3.2.2., two MOA roadway projects began in 2016 that incorporated LID into the project. The LID components of the West Dimond Project were completed.

During the past year, a number of new subdivisions incorporated LID measures in road and drainage infrastructure to reduce stormwater runoff. These include Huffman Timbers and The Terraces (oversized detention pipes), Fairview Subdivision (infiltration gallery), and Grover Place (swales/infiltration galleries).

Parking Lot Retrofit

The Permittees will retrofit one parking lot in this 5-year permit term. Work has continued during 2016 to identify a suitable site. The MOA has tentatively identified a potential project for the planned expansion of the Valley of the Moon Park parking lot. Work will continue in 2017 to determine is a suitable site for a parking lot retrofit project. Results from the analysis will be included in the LID Evaluation Report identified in Section 3.2.2.

3.3 Permanent Storm Water Controls Plan Review and Approval

ADOT&PF Projects. ADOT&PF continues to review all projects during the three phases of the project development:

- Local Review (approximately 30 to 50 percent complete)
- Plans-In-Hand Review (approximately 75 percent complete)
- Pre-Plans, Specification and Estimate (Pre-PS&E) Review (approximately 95 percent complete)

ADOT&PF requires Erosion and Sediment Control Plans (ESCP) for each project covered under this permit. The ADOT&PF assigns design and environmental staff, the Central Region Hydrologist and an ADOT&PF Central Region Stormwater Specialist to review the ESCP. The review process for Airport projects is:

- The ESCP writer creates a project –specific ESCP at the Plans-in-Hand phase
- Individuals enter their review comments into the Design Review Comment web page or give the ESCP writer red-lined edits of the ESCP

- ESCP writer can discuss comments or the red-lined edits with the individual who wrote the comments. ADOT&PF enters all comment responses in the comment web page
- Individuals review the Revised ESCP at the Pre-PS&E phase
- Individuals review of Pre-PS&E ESCP and follow the same process as the Plans-in-Hand ESCP
- The ADOT&PF Design Project Manager checks and verifies the ESCP review comments are incorporated at the time bid documents receive Federal Aviation Administration (FAA) project certification. The FAA requires ADOT&PF Certifications stating that they will comply/have complied with statutory and FAA-imposed administrative requirements.
- The Design Project Manager files the ESCP comments after certification

The review process for Highway projects is:

- The ESCP writer creates a project–specific ESCP at the Pre-PS&E phase
- Individuals submit their written comments to the Design Project Manager or give the ESCP writer red-lined edits of the ESCP
- ESCP writer can discuss comments or the red-lined edits with the individual who wrote the comments. ADOT&PF enters a response to all comments
- The Design Project Manager checks and verifies the ESCP review comments are incorporated at the time bid documents receive Federal Highway Administration (FHWA) project certification. The FHWA requires ADOT&PF certification stating that the PS&E is complete and has been developed in accordance with applicable design standards and the Title 23 USC responsibilities assumed by ADOT&PF in the Stewardship and Oversight Agreement dated December 21, 2012.
- The Design Project Manager files the ESCP comments after certification

In addition, on larger projects, a separate ESCP-focused meeting occurs after the Pre-PS&E review. This meeting discusses the ESCP comments from above and project-specific stormwater issues. The Design Project Manager follows the same process as described above to check and verify ESCP review comments and then files the comments after certification.

Private Development. The Municipality continues to review all work requiring building permits and new subdivisions for permanent stormwater runoff practices. Issuance of a building or stormwater permit will serve as written approval as specified by the APDES MS4 Permit. The Muncipality manages construction reviews through an electronic submittal and tracking system which applies a comprehensive review checklist to all projects. Records are available on request. Qualified review staff are trained in detention and other permanent control techniques through a number of programs including those covered in Section 3.5.

Municipal Projects. The Municipality performs a regulatory review of all Municipal projects 10,000sf and greater in compliance with our MS4 Permit requirement under part 3.2.4. The reviews encompass construction erosion control measures and permanent stormwater management practices. Reviews are documented through the Municipality's online tracking system and are a requirement for development project permit issuance. The MOA will continue to coordinate with ADEC to insure our projects meet the ADEC waste water regulations.

3.4 Permanent Storm Water Management Controls Tracking and Enforcement

3.4.1 Inventory and Tracking

The Municipal Street Maintenance Division acquired and began implementing an asset management database they use to inventory and track municipal- and state-owned stormwater controls. This inventory and tracking database allows Street Maintenance to access information about the condition and maintenance requirements of the stormwater controls owned by the permittees.

The ADOT&PF and CBERRSA worked with WMS to capture information about state owned and areawide controls. During the second term of the permit, they mapped stormwater controls using GPS instruments and populated the asset management database. During the third term they make periodic updates to incorporate MS4 public improvements as well as new information from construction record drawings.

Private Storm Water Controls. During the second term of the permit WMS developed a database for new and existing stormwater controls and, has since, updated it annually to include new development. As-built drawings of private stormwater controls are required prior to closing a Municipal Building Permit for new and redeveloped properties. These as-builts are scanned and recorded into the database. The Municipality also requires submittal of an Operations and Maintenance (O&M) agreement for private stormwater controls.

3.4.2 O&M Agreements

In 2015, WMS started requiring a legally enforceable and transferable O&M agreement for private stormwater controls on new and redeveloped properties to generate regular maintenance on private stormwater controls and demonstrate it to the Municipality. These O&M agreements are entered into a municipal database created to assist tracking and inspection of the permanent controls.

In 2016 the MOA received 8 legally recorded O&M agreements.

3.4.3 Inspection and Enforcement

The Permittees must ensure proper long term operation and maintenance of permanent storm water management practices through an inspection program.

ADOT&PF and Municipal Storm Water Infrastructure. See Section 5 for details on inspection and maintenance of ADOT&PF and Municipal stormwater management controls and infrastructure.

Private Storm Water Management Controls. Under the updated SWTPRGM, the Municipality now requires as-built (record) drawings of all constructed stormwater controls that were approved under a Municipal permit for projects 10,000 sf and above. They are scanned into a tracking database.

Projects falling under this new requirement must request a permanent control inspection to obtain a conditional certificate of occupancy. As part of this process, projects must provide a surveyed as-built of permanent stormwater controls and a recorded maintenance agreement with the Municipality for the upkeep of these controls. The Municipality manages installed permanent stormwater controls as a “use permit” similar to elevators and will require periodic re-certification and inspections based on site sensitivity and past compliance. Maintenance records will be required from the owner/operator prior to renewal. High priority sites, requiring, annual inspection, will be identified based on Checklist #3 of Building Safety Handout AG 21.

In 2016, two as-builts were received through the permanent controls process, and inspections were performed on the associated sites. In both cases the sites were constructed as represented. WMS will,

annually hereafter, send the project owner an inspection form for use by the property owner to demonstrate their BMP maintenance.

3.5 Permanent Storm Water Controls Training

ADOT&PF. ADOT&PF conducts quarterly design meetings for all design and environmental staff, including topics related to permanent stormwater controls. In addition, ADOT&PF technology transfer staff set up annual training schedules with some courses specifically focused on storm water and drainage issues.

Municipality. MOA design and construction staff received training on Stormwater Post-Construction BMPs, and LID at a number of presentations throughout the year:

- 2016 Watershed Update/APDES Annual Meeting: March 1, 2016. This half-day meeting reviewed the findings of monitoring, assessments, mapping, and new programs associated with the permit. It also provided training and discussion groups for permanent BMPs available to meet detention requirements. It was attended by members of all participating MOA departments.
- Managing Risk Under the MS4 Permit: November 9, 2016. This one hour live on-line course was focused on helping MS4 operators identify areas that are in and out of the MS4 area and look for areas where problems commonly occur in the storm system.
- Managing Stormwater on Industrial Sites, BMP Selection & Evaluation: November 9, 2016
- Looking Through the Storm: Utilizing Information from Implementation and Monitoring to guide Storm Water Management Efforts, November 9, 2016

4 Industrial and Commercial Discharge Management

4.1 Inventory of Industrial and Commercial Facilities

An inventory and map of facilities discharging to the MS4 has been updated. It contains the industrial sectors currently tracked as well as all industrial sectors listed in 40 CFR 122.26(b)(14), and a number of commercial locations including vehicle or equipment wash systems and animal facilities with the potential of negatively impacting the MS4. A revised inventory and map are provided in the 2016 Annual Report in Appendix D1. In comparing the current year's review to prior years' inventories, the permittees identified facilities that did not appear to have current Industrial SWPPPs. ADEC was notified of the discrepancies.

4.2 Snow Disposal Sites

Part 3.3.2 requires permittees, within one year of the Permit effective date, to "...inventory and map locations of all permittee-owned and privately owned snow disposal sites that discharge directly to the MS4 or to receiving waters.." with mapping updates performed annually thereafter. In 2015, the permittees reviewed conditional use permits, interviewed rights of way staff, and WMS inspectors for changes to the map and list of all permittee-owned and all known privately-owned snow disposal sites and found there were no changes from previous submittals. The updated map is provided in Appendix D2 with no additional sites added in 2016.

During the second permit term a decision was made to place additional regulation on snow disposal sites as part of the Anchorage Municipal Code Title 21 revision of December 2010 and the larger Title 21 Land Use Code re-write expected to be adopted in February of 2013. This project summary of considerations and resulting regulatory updates was submitted in 2011. The relevant ordinance in Title 21.07.004.F of the Land Use Code was implemented January 2014. It is available at www.muni.org . As follow-up to this regulatory change, and by the end of the fourth year of the third term, the MOA must evaluate the program for effectiveness in protecting water quality.

4.3 Animal Facilities

The Municipality of Anchorage continues to track animal control facilities under the current program, based on Permit Part 3.3.3. The Municipality must, within three years of the effective date of the permit, evaluate the program implemented in 2010 for animal facilities to prevent waste from facilities or other locations from entering the MS4 and protect water quality. This project will be submitted in the 2018 annual report.

The results from the animal facility program evaluation must be applied as needed to revise all requirements by the end of the fourth year of the permit.

4.4 Storm Sewer System Inventory and Mapping

The Municipality and ADOT&PF annually update their MS4 inventory from construction record drawings as required under Permit part 3.4.1. This inventory includes:

- Pipe systems
- Inlets, catch basins and outfalls
- Structural stormwater treatment controls
- Receiving waters of the MS4
- Subbasin of each outfall
- MS4 roads and parking lots, and
- MS4 maintenance and storage facilities and snow disposal sites.

In 2016, the Municipality and ADOT&PF began work on additional requirements of the Permit Section 3.4.1 that must be completed within 3 years of the effective date of the Permit. These include developing a maintenance tracking base for the portions of the MS4 that are not covered by current databases, updating existing coverages, and collecting information related to OGSs outlined in Permit Section 3.4.1.7.

These maps showing the combined ADOT&PF and MOA infrastructure, are updated regularly and are available at: http://www.anchoragestormwater.com/maps.html .

4.5 Catch Basin and Inlet Inspections and Maintenance

In compliance with Permit part 3.4.2 the permittees are required to conduct an inspection program to evaluate all permittee-owned or operated catch basins and inlets at least annually and take appropriate maintenance action based on these inspections. All principle MS4 maintenance agencies of the permittees have implemented an inspection and maintenance program.

Central Region Division's Maintenance & Operations (M&O), the maintenance arm for ADOT&PF's Anchorage MS4 jurisdiction, is continuing mapping efforts to correct existing ADOT&PF pipe mapping as

well as capture new pipe features for inclusion in maintenance mapping sets. In 2016, ADOT&PF inspected 3,405 structures and cleaned 1,021 catch basins. In addition, they inspected and cleaned 42 OGS. In all, they cleaned 5,370 linear feet of pipe in the MS4 system.

The Municipality's authorized MS4 maintenance agency for the Chugiak-Birchwood-Eagle River Rural Road Service Area (CBERRRSA) implemented a comprehensive catch basin and inlet inspection and maintenance program for their service area. In 2016, 1,273 structures were inspected, and 522 catch basins, 337 catch basin manholes, 10 oil & grit separators (OGS) and 8 drywells were cleaned.

The Municipality's authorized MS4 maintenance agency for the Girdwood Road Service Area (GSA) implemented a comprehensive catch basin and inlet inspection and maintenance program for their service area. In 2016, 50 catch basin and manhole structures were inspected.

The Municipality's Anchorage Road and Drainage Service Area (ARDSA) comprising most roads in Anchorage not maintained by road service areas or owned by ADOT&PF continued its ongoing OGS and catch basin inspection and maintenance program. During 2016, 9695 controls were inspected, 242 OGS units and 1837 catch basins were cleaned.

By the fourth year of the Permit term, the Permittees will develop rate of fill data for the catchbasins and update their respective cleaning schedules accordingly. This project is being undertaken, for each the Municipality and ADOT&PF, by identifying representative basins according to landuse and tracking their fill rates over a three year period. These rates will then be applied to basins of similar character, and basins will be cleaned according to the rate-of-fill schedule unless information is gained about specific basins which supersedes the applied rate.

Additionally Permittees will develop SOPs for treatment and disposal of their catchbasin and OGS wastes by the fifth year of the permit.

4.6 Street and Road Maintenance

4.6.1 Standard operating procedures

Standard Operating Procedures were reviewed in 2015 in advance of the second year Permit requirement for Municipal and ADOT&PF street maintenance agencies. These documents are presented again in in Appendix E1 with relevant procedural updates and corrections to Permit references.

4.6.2 Inventory of materials

Part 3.4.4.2 of the Permit requires permittees to "..maintain an inventory of street/road maintenance material, including use of sand and salt.." and report the inventory in the annual report. Road maintenance materials used by all Anchorage MS4 operators include primarily winter traction enhancing materials. The types of materials used vary somewhat from agency to agency and from street to street but mostly include application of traction-enhancing sands and a variety of deicers and anti-icers. The bulk of deicers are added to the sand prior to its application to the road surface to maintain sand fluidity in sanding vehicles and to help embed the sand particles in road ice. Sand gradations vary by agency with ADOT&PF operators typically using a somewhat finer gradation for their mostly higher speed roads than Municipal operators both for safety reasons and to improve stability of the sand on the road surface. Inventory tables of these materials are summarized in Table 5.1 below.

4: Table 5.1 – Anchorage MS4 Street Materials Inventory, 2016

Item	Type	Units	Amt. Stored 2016	Amt. Ordered 2016	Amt. Used 2016	Storage Location
ADOT&PF						
Sand	M&O spec.	ton	15,000	5,502	4,723	Anchorage
Sand	M&O spec.	ton	6,000	2,000	2,000	Birchwood
Sand	M&O spec.	ton	7,000	4,001	3,870	Girdwood
NaCl	granular	ton	990	950	4,723	Anchorage
NaCl	granular	ton	0	0	0	Birchwood
NaCl	granular	ton	16	150	134	Girdwood
MgCl2	brine	gal	-	-	-	Girdwood
MOA-CBERRRSA						
Sand	ARDSA spec.	ton	18,750	16,000	21,863	Hiland
NaCl	granular	ton	0	0	0	Hiland
MgCl2	brine	gal	10,223	As needed	22,992	Hiland
MOA-ARDSA						
Sand	ARDSA spec.	ton	25,000	5,000	11,000	Anchorage
NaCl	Granular	Ton	0	0	35	Anchorage
MgCl2	brine	gal	20,000	10,000	33,733	Anchorage
MOA-GRSA						
Sand	E-chips	Ton	-	752	-	Girdwood
NaCl	Granular	Ton	-	48	-	Girdwood
MgCl2	brine	gal	-	-	-	Girdwood

4.6.3 Covered Sand Storage

Within four years of the effective date of the Permit the Permitees must complete an evaluation of the performance of the sand storage facilities developed during the second term at each of their primary materials storage locations. The evaluation must include an analysis of the amount of salt reduction resulting from the warm. Plans for this project will begin in 2017.

4.7 Street and Road Sweeping

4.7.1 Sweeping Management Plan

The permittees are updating their Street Sweeping Management Plans and addressing the recommendations of the *Anchorage Street Sweeping and Storm Water Controls: 2013 Performance Evaluation*. In the second term MOA and ADOT submitted a combined plan, however, in the third term the permittees each developed individual sweeping plans, submitted with the 9-month report as required by Permit Part 3.4.5.1., to accommodate differences in their respective sweeping operations.

A list of roads where sweeping is technically infeasible is provided in the 2015 Annual Report which included alternative control measures as required by Permit Part 3.4.5.3. A visual inspection was performed to identify trash or other pollutant issues, and addressed and documented in the form of ditch cleaning and catch basin cleaning. Additional measures may be identified for these roads as needed.

In 2016 the Permittees began sweeping the streets according to the new schedules and sweeping plan. The 2016 sweeping activities were performed consistent with their new plan and schedule. The ADOT&PF and MOA Sweeping Reports are provided in Appendces E2 and E3.

4.7.2 Sweeping Assessment

Permit Part 3.4.5.4 requires the permittees to "…perform annual assessments of street sweeping effectiveness to minimize pollutant discharges to storm drains and creeks..." on the basis of the permit defined performance factors.. The permittees have provided their 2016 summaries of street sweeping activities in their sweeping reports. Table 5.2 presents volumes of road materials picked up during the spring, summer, and fall sweeps.

5: Table 5.2 – Anchorage MS4 Sweeping Summary, 2016

Spring 2016

	EPA Category	Drainage Type	Street Miles	PickUp Miles	Total Volume* (cyds)	Unit Volume* (cyds/mile)
DOT	**Arterial**	OC	8.1	31.3	135.0	4.3
		CG	43.9	198.8	2756.0	13.9
		Mixed	48.5	188.2	3150.0	16.7
		Total	100.5	418.3	6041.0	14.4
	Residential	OC	54.8	144.4	745.0	5.2
		CG	3.1	20.3	159.0	7.8
		Mixed	26.9	107.7	499.0	4.6
		Total	84.7	272.4	1403.0	5.2
ARDSA	**Arterial**	Mixed	45.8	91.6	2961.0	32.3
	Residential	Mixed	580.6	1161.3	2445.0	2.1
CBERRRSA	**Residential**	OC	93.1	122.1	570.0	4.7
		CG	21.7	43.3	522.0	12.0
		Mixed	79.9	160.3	375.0	2.3
		Total	194.6	325.7	1467.0	4.5

Summer 2016

	EPA Category	Drainage Type	Street Miles	PickUp Miles	Total Volume* (cyds)	Unit Volume* (cyds/mile)
DOT	**Arterial**	OC	8.1	31.3	35.0	1.3
		CG	43.9	198.8	581.0	2.9
		Mixed	48.5	188.2	548.0	2.9
		Total	100.5	418.3	1164.0	2.8
	Residential	OC	54.8	144.4	220.0	1.5
		CG	3.1	20.3	41.0	2.0
		Mixed	26.9	107.7	144.0	1.3
		Total	84.7	272.4	405.0	1.5
ARDSA	**Arterial**	Mixed	45.8	91.6	60.0	0.7
	Residential	Mixed	580.6	*	20.0	*
CBERRRSA	**Residential**	OC	93.1	122.1	No Data Reported	
		CG	21.7	43.3	No Data Reported	
		Mixed	79.9	160.3	No Data Reported	
		Total	194.6	325.7	No Data Reported	

*ARDSA and CBERRRSA Residential roads were swept on an "as-needed" basis to maintain a "visually clean" standard during the summer sweep period

Fall 2016

	EPA Category	Drainage Type	Street Miles	PickUp Miles	Total Volume* (cyds)	Unit Volume* (cyds/mile)
DOT	**Arterial**	OC	8.1	31.3	40.0	1.3
		CG	43.9	198.8	788.0	4.0
		Mixed	48.5	188.2	754.0	4.0
		Total	100.5	418.3	1582.0	3.8
	Residential	OC	54.8	144.4	273.0	1.9
		CG	3.1	20.3	62.0	3.1
		Mixed	26.9	107.7	193.0	1.8
		Total	84.7	272.4	528.0	1.9
ARDSA	**Arterial**	Mixed	45.8	91.6	60.0	0.7
	Residential	Mixed	580.6	1161.3	820.0	0.7
CBERRRSA	**Residential**	OC	93.5	132.0	201.0	1.5
		CG	18.3	36.5	81.0	2.2
		Mixed	87.7	174.8	183.0	1.0
		Total	199.4	343.3	465.0	1.4

* Volumes represent only swept materials collected along reported/estimated Curb/PickUp Miles
OC = Open Channel Drainage
CG = Curb and Gutter Drainage

For 2016 ADOT&PF reported 100% completeness for all road segments and operational areas for the spring, summer, and fall sweep periods. CBERRRSA reported 100% completeness for the 2016 spring and fall sweep periods with no reported road segments or operational areas falling below permit requirements. CBERRRSA also stated that they performed spot sweeping as needed in the fall period to address areas of excess leaf and organic matter (these spot sweeps were in addition to the standard fall sweep of all road surfaces). For the 2016 summer sweep period CBERRRSA reported that roads were swept 'as needed' in order to maintain a 'visually clean standard' (as prescribed in the Street Sweeping Management Plan). CBERRRSA took and submitted before-sweep and after-sweep photos to support their assessment that roads were deemed 'visually clean' after sweeping. ARDSA reported a sweeping completeness of 100% for designated streets within its administrative authority for the 2016 spring and fall sweep periods. For the 2016 summer sweep period ARDSA reported sweeping all of the Arterial type roads within its administrative authority, and swept Residential roads as needed in order to maintain a 'visually clean standard'. Additionally, they ran at least one sweeper between sweeps and until winter freeze-up to pick up leaves and other matter.

4.8 Pesticide, Herbicide, and Fertilizer Applications

The Municipal pesticide code is located in Title 15.75, available at: http://library.municode.com/index.aspx?clientId=12717. It was updated during the second term to strengthen application restrictions, notifications, and certification requirements. These code requirements are enforced at Municipal facilities and an applications log is maintained.

During 2016 permittees used pesticides in their greenhouses, the application log is presented in Appendix E5.

4.9 Storm Water Pollution Prevention Plans

Stormwater Pollution Prevention Plans for certain permittee-owned activities were developed in the second term of the Permit term. Permittees developed plans for their material storage facilities, maintenance yards, and snow disposal sites. They are available at the italicized facilities for each owner in Table 5.3 and where practical at each facility site.

Inspection

In 2016 inspections indicated by Stormwater Pollution Prevention Plans were performed at the facilities indicated in Table 5.3. Corrections were made as needed. The inspection reports are on file at each of the facility offices and provided in Appendix E4.

4.10 Training

The Municipality and ADOT&PF met periodically during 2016 to coordinate their respective activities and discuss operational issues. Street managers from ADOT&PF and MOA participated in the 2016 Annual Meeting summarized in Section 2.4.

ADOT&PF crews participated in:

- 3/1/16 MS4 Annual Meeting – Presented by MOA
- 4/13/16 MS4 Virtual Expo
- 11/3/16 Maintenance Stormwater Field Guide Training

Municipal Maintenance crews, at regular staff meetings, were given information regarding APDES Permit requirements in a variety of presentations and staff meetings to assist their understanding, decisions, and record-keeping about activities associated with Permit compliance. Training was conducted for Sweeping Practices/Protocol, project BMP's, SOP's and Spill Prevention/Response.

MOA-ARDSA has 21 trained/certified AK-CESCL staff. An additional 48 employees received instruction in erosion and sediment control.

6: Table 5.3 – MS4 Facilities with Storm Water Pollution Prevention Plans

Facility	Location	Activities
ADOT&PF		
Birchwood Maintenance	20651 Birchwood Spur Rd., Birchwood	Equipment & Materials Storage
Girdwood Maintenance	MP 90 Seward Hwy., Girdwood	Equipment & Materials Storage, Maintenance
Anchorage Maintenance	5300 E. Tudor Rd., Anchorage	Equipment & Materials Storage, Maintenance
O'Malley Snow Disposal	O'Malley & O Seward Hwy, Anchorage	Snow Storage
Tudor Snow Disposal	Tudor Road, Anchorage	Snow Storage (operating under ARDSA SWPPP)
Hiland Road Snow Disposal	Hiland Road, Eagle River	Snow Storage
CBERRRSA		
Eagle River Maintenance	8501 Hesterberg Ln, Eagle River	Equipment & Materials Storage
Chugiak Maintenance Facility	19200 Kerbow Ln., Chugiak	Equipment & Materials Storage
ARDSA		
Kloep Maintenance Facility	5701 Northwood Drive, Anchorage	Equipment Maintenance, Materials Storage & Snow Storage
Muldoon Maintenance & Storage Facility	7909 Boundary Ave., Anchorage	Equipment Maintenance & Materials Storage
Native Heritage Snow Disposal	8902 Heritage Center Drive, Anchorage	Snow Storage
Northwood Snow Disposal Site	Northwood Drive, Anchorage	Snow Storage
Commercial Dr. Snow Disposal	Commercial Drive, Anchorage	Snow Storage
Mountain View Snow Disposal	Mountain View Drive, Anchorage	Snow Storage
Sitka Street Snow Disposal	Sitka Street, Anchorage	Snow Storage
Tudor Snow Disposal	Tudor Road, Anchorage	Snow Storage
C Street Snow Disposal	C Street, Anchorage	Snow Storage
Dowling Snow Disposal Site	Dowling Road, Anchorage	Snow Storage

5 Illicit Discharge Management

5.1 Illicit Discharge Regulatory Strategy

The Municipal regulatory authority for water pollution control is founded on Title 21.07.040, http://library.municode.com/index.aspx?clientId=12717. This code provides the basis for managing discharges to the storm sewer and waters of the U.S. It was updated effective January 2011 to conform to Permit requirements consistent with Part 3.5.1.1, provide a stormwater permit for discharges not covered under building permits, and accommodate CGP review authorities. It was carried forward into the Title 21 rewrite to its new position in Title 21.07.04.

5.2 Illicit Discharge Reporting and Response

The Pollution Hotline, 343-4141, continues to operate with staff taking calls during regular business hours and retrieving messages from callers with complaints during non-business times. These hotline complaints are recorded into the Municipality's Hansen Complaint Management System and forwarded to the appropriate department for response.

The Infor Public Sector System (a new version of the Hansen System software, implemented in 2015) is also available to community members on the Municipal Development Services Building Safety Land Use Code Enforcement website http://www.muni.org/Departments/OCPD/development/BSD/Pages/CodeEnforcement.aspx for on-line complaint recording and tracking.

Table 6.1 (below) tallies complaints recorded through the on-line tracking system. Complaints were followed up within the required two working days, and resolved within a week. *Stormwater – construction* complaints were handled with the inspections in the Construction Site Management Program. *Prohibited discharges* complaints were handled as illicit discharge complaints.

7: Table 6.1 – Service Requests by Complaint Type, 2016

Department	Complaint Type	Number of Requests	Number Resolved
WMS	Stormwater – Construction	11	11
WMS	Prohibited Discharges – Private property	6	6
ROW	Prohibited Discharges – ROW	7	7

Illicit Discharge mapping

Appendix F1 contains a location map of 2016 Anchorage prohibited discharge complaints. Inspectors visited all sites and, where appropriate, initiated clean-up. There were no recurrences associated with any of the discharges.

5.3 Dry Weather Screening

The permittees continued to implement the re-designed dry weather screening program in compliance with Permit requirements. The 2016 report is provided in Appendix F3 and the monitoring plan was provided along with the QAP in the six-month submittal. In 2016, there was one exceedance for fecal coliform at outfall 105-1 located near the intersection of Old Seward Highway and International Airport Road. The piped system drains the area from East 54th to East 58th Avenue between the Old and New Seward Highways. The exceedance was not noticed and flagged by field staff in time to follow up this sampling year as it was barely above threshold, therefore it will be resampled in the 2017 screening.

5.4 Spill Prevention and Response

The permittees must prevent, respond to, contain and clean up all sewage and other spills that may discharge into the MS4. To meet this requirement the permittees convened a group of interested participants and mapped out current Anchorage response. The information that came from these discussions was drafted into a Spill Response Program Agreement. The working group continues to coordinate the spill response program and has update it in 2016 to reflect administrative changes. It is presented in Appendix F2.

2016 Spill Response

In 2016 the Municipality of Anchorage responded to two spills. The first spill was 5 to 20 gallons of diesel fuel that was spilled in the parking lot of an apartment building located at 1500 Russian Jack Dr. The spill occurred overnight and was discovered the next morning by an employee of the apartment's property management company Wright Services. The employee contacted AFD and ADEC to report the spill and AFD provided initial response, including setting up absorbent booms to prevent diesel from entering the stream channel adjacent to Russian Jack Dr. ADEC reported the spill and met with MOA WMS staff on site to investigate the extent of contamination. Privately owned storm drain structures in the parking lot were found to be contaminated with diesel, but no pipe connections to municipal storm drains or the stream were found. Wright Services contracted Environmental Compliance Consultants Inc. to clean up the parking lot and the affected private storm drain pipe, and a copy of the cleanup report was submitted to WMS staff. The second spill was of less than five gallons of antifreeze in the gutter near 1431 E 9th Ave. The spill was reported to the MOA, WMS staff investigated and confirmed that a quantity of antifreeze was confined to

the gutter and had not made it into the storm drain. WMS staff reported the spill to ADEC upon corroboration of the complaint as it constituted a spill of a hazardous substance. WMS staff contacted NRC Alaska Inc. (formerly Emerald Alaska Inc.) who holds a contract with the MOA for cleaning up spills of hazardous materials. NRC Alaska Inc. submitted a cleanup report with photos to WMS staff.

ADOT&PF reported there were no hazardous material spills on any DOT&PF Construction projects in 2016. There were no spills on any DOT&PF M&O roads or maintenance stations in 2016.

5.5 Used Oil and Toxic Materials

The permittees have an ongoing program for accepting hazardous materials including used oil and toxic waste at the Anchorage Regional Landfill and Central Transfer Station. Those locations will accept up to five gallons of household hazardous waste for free. Information and public education materials for this program are found on the Municipal Solid Waste Services homepage at http://www.muni.org/departments/sws/pages/default.aspx

5.6 Training

Training for identifying and eliminating illicit discharges, spills, and illicit connections to the MS4 was performed with the implementation of the Dry Weather Screening Monitoring as outlined in the Monitoring Plan.

Staff training was supported by:

- Storm Water Solutions, Looking Through the Storm: Utilizing Information from Implementation and Monitoring to Guide Stormwater Management Efforts, November 9, 2016
- Storm Water Solution, Defining your Municipal Separate Storm Sewer System: Managing Risk Under the MS4 Permit, November 9, 2016

6 Public Education and Involvement

6.1 Public Education and Involvement

The Municipality, on behalf of the permittees, entered into an agreement with the Anchorage Waterways Council (AWC) to conduct the ongoing public education required by the Permit. A full account of education activities for 2016 is provided in Appendix G1 and summarized below.

In 2016, AWC continued work on one of their main education outreach efforts, the Scoop the Poop program. The Scoop the Poop Committee, comprised of land management agencies, canine interest groups, and MOA Animal Care and Control, identified seven community events where a Scoop the Poop table would be present. AWC continues to maintain a Scoop the Poop Anchorage page on Facebook (www.facebook.com/ScoopthePoopAnchorage/) and has tallied the number of people reached in 2016 with posts. Three thousand and thirty-seven viewers saw Facebook posts for the first 10 months of 2016. Other Scoop the Poop efforts include:

- Scoop the Poop Day was held on April 16th.
- 14 new Mutt Mitt stations were added to the Municipality for a total of 143

- Educational outreach efforts about waterfowl and high fecal coliform counts in the Cuddy Pond (a portion of Fish Creek) appears to be making a difference based on laboratory samples
- Creating wintertime signage for Goose Lake to prevent accumulation of dog waste on the frozen lake.

Other outreach programs included the Annual Sears Garden Show on April 9. AWC has been collecting surveys from garden event attendees for several years. These include the Sears Mall Spring Garden Show and The Alaska Botanical Garden's many events. Between 2012 and 2016 AWC has received survey information from over 275 participants. These surveys focused on individual gardening habits and preferences, particularily in regards to herbicide, pesticide, and fertilizer use.

During 2016, AWC continued to provide outreach about water quality concerns for a number of local news stories in TV and print media.

6.2 Targeted Education and Training

See the following sections of this Annual Report regarding targeted training for permittee staff:

- Construction - Section 2.4
- New and Redevelopment - Section 3.5
- Stormwater Infrastructure - Section 4.10
- Illicit Discharge - Section 5.6

6.3 Annual Meeting

The 2016 Annual Meeting provided information to participants about the activities related to the Municipal Separate Storm Sewer System (MS4) Permit. The meeting was held the morning of March 1st at the BP Energy Center and attended by over 75 people with an interest in stormwater management. The meeting used an "open house" format and included poster displays summarizing first year permit activities. An introduction and outline of the requirements of the Term III Permit was provided. A description of the planned 2016 activities was provided. Two presentations were delivered: 1.) Notification of new imagery and LiDAR acquisition that is available for stormwater modeling. 2.) An update of the status of the MOA DCM update, and introduction of the two-volume Stormwater Manual format. The final event of the meeting was a Q&A session where MOA, ADOT staff and contractors were on hand to answer any questions about the items that were presented as part of the meeting. Presentation slides, program agenda, and poster summary are available in Appendix G2.

6.4 Semi-Annual Meetings

Semi-annual meetings between the permittees and Alaska Department of Environmental Conservation (ADEC) were conducted in 2016 to provide a forum of discussion regarding permit activities and issues. These meeting summaries are available in Appendix G3.

6.5 Storm Water Website

In 2016 the permittees provided access to their website found at www.AnchorageWatershed.com or www.AnchorageStormwater.com . This homepage, received a major update in 2013 to ensure it contains all program information including project reports, data, map products, forms, permit applications, Storm Water Pollution Prevention Plan (SWPPP) guidance, and watershed plans. This site is accessible

additionally through the municipal website:
http://www.muni.org/Departments/works/project_management/WM/Pages/Default.aspx .

7 Monitoring and Assessment

7.1 Discharges to Water Quality Impaired Waters

As listed in the Permit, pollutants of concern in Anchorage receiving waters include fecal coliform, petroleum products, and, for one lake, dissolved oxygen. The Municipality, acting on behalf of the permittees, will measure and evaluate the effectiveness of activities to control these pollutants of concern through the following means:

- Stormwater outfall monitoring
- Controls effectiveness monitoring
- Dry weather screening and follow-up
- Public education and involvement program

7.2 Monitoring Plan

The Municipality, on behalf of the permittees, updated the "Quality Assurance Project Plan" for third term activities. The Municipality, on behalf of the permittees, conducts monitoring for various purposes as summarized in Table 8.1.

8: Table 8.1 – Storm and Surface Water Monitoring Program Schedule

Monitoring Program Component			Proposed Sampling Dates		
	2015	2016	2017	2018	2019
Pesticide Screening	None	Aug-Sept	none	Aug-Sept	None
Dry Weather Screening	May-Sept	May-Sept	May-Sept	May-Sept	May-Sept
Control Measure Effectiveness	April-Nov	April-Nov	April-Nov	April-Nov	April-Nov
Snow Storage Site Retrofits	None	None	Mar-Jun	Mar-Jun	None
Stormwater Outfalls	Apr-Nov	Apr-Nov	Apr-Nov	Apr-Nov	Apr-Nov
LID Monitoring	May-Oct	May-Oct	May-Oct	May-Oct	May-Oct

7.2.1 Pesticide Screening

This sampling program is a continuation of the program began with the first permit term. Sampling was conducted in the second year and will be repeated in the fourth year of the permit term. The results are

documented in Appendix H1. The project deviated from the Permit in two ways: monitoring was performed in the fall rather than late summer, and the analytical testing method was revised from the immunoassay test kits called for in the Permit, because the kit was not available. The samples were instead taken to the laboratory for testing. The method and QAP were updated accordingly.

7.2.2 Snow Storage Site Retrofits

The APDES stormwater discharge permit for the Anchorage MS4 requires monitoring of the retrofitted public snow storage sites relative to criteria already developed and published by the MOA-Watershed Management Section regarding siting, design and operation of these types of facilities.

The permittees will continue monitoring Tudor Road Municipal snow disposal site and Spruce Street Municipal snow disposal site during years two and three and four of the third permit term. Original plans to sample in 2016 were revised in response to lack of snow in the storage sites based on the low 2015-16 snow season.

7.2.3 Storm Water Outfall Monitoring

Storm Water Outfall Monitoring was continued in 2016 according to the plan approved for the third term. Results are provided in Appendix H2. Also included in the report is an analysis of trends and observations for the data year.

The sampling sites were re-assessed for appropriateness prior to starting the 2016 sampling season and one adjustment was made as described in Section 3.2 of the 2016 Stormwater Outfall Monitoring Report provided in Appendix H2.

An evaluation of monitoring results is required in years one and four of the Permit term with results provided with the applicable annual report. The first year evaluation, provided in Appendix H3, discusses the effectiveness of street sweeping to reduce turbidity and fecal coliform in the outfall and covers public education to reduce fecal coliform bacteria in the outfall.

7.2.4 Quality Assurance Plan

The Quality Assurance Plan (QAP) Appendix A for pesticide monitoring activities has been updated to adjust for a revision in the testing method for 2,4 D and Carbaryl. The QAP excerpt is provided in Appendix H4.