CITY OF TEMPE

2011-2012

ANNUAL PHASE I MS4 REPORT

As Prescribed by AZPDES Permit No. AZS000005-2010 Appendix B

September 2012

Prepared by the City of Tempe
Public Works Department
Water Utilities Division
Environmental Services Section
Regulatory Compliance Group

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1. General Information

A. Name of Permittee

City of Tempe

B. Permit Number

AZPDES Permit No. AZS000005-2010

C. Reporting Period

July 1, 2011 – June 30, 2012

D. Stormwater Mgt. Program Contact

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2. Annual Report Certification

The Annual Report Form (ARF) must be signed and certified by either a principal executive officer or ranking elected official; or by a "duly authorized representative" of that person in accordance with Sections 9.2 and 9.12 of the Permit.

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 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.

Signature of Certifying Official

Date

3. Narrative Summary of Stormwater Management Program Activities Report

This section provides a status summary addressing stormwater management program activities required by AZPDES Permit No. AZS000005-2010 (Permit). Included is a brief description of program or activity implementation and progress or challenges, where applicable, in each area during the reporting year. If applicable, any significant developments or changes to the number or type of activities, frequency or schedule of activities, or the priorities or procedures for specific management practices are explained. This section includes wording required by Appendix B of the Permit and additional information provided by Tempe.

A. Public Awareness Activities Including Outreach

Tempe Activities

Tempe has exceeded Permit requirements outlined in Appendix A, Sections I.A and I.B, by coordinating and participating in several public and business sector awareness and outreach activities. During the 2011-2012 reporting year, Tempe has reached nine target groups totalling approximately 106,898 people and/or businesses while covering a wide array of stormwater topics. In some cases this number includes the same audience, though the stormwater message varies (i.e., Tempe resident messages through *Tempe Today* articles and Tempe businesses through *E-Bulletin* distribution). Table 1 summarizes events, topics, estimated number of people reached (where possible), number and type of materials distributed, and target groups. Examples of outreach materials, brochures, articles, and E-Bulletins can be found in **Attachment A**.

Table 1: Summary of Public Awareness Activities and Outreach

Outreach Events	Date	Topic(s)	Number of People or Businesses Reached	Number and Type of Materials Distributed	Target Groups
Industrial Facilities	Jul-11 through Jun-12	Stormwater information for industrial facilities	40	Various BMP informational brochures provided to industrial & commercial facilities during inspections	Industrial & Commercial Businesses
Municipal Facilities	Jul-10 through Jun-11	Stormwater information for residents	5,000	1100 bookmarks & 800 NPS puzzles; 200 each: Home Repair, Yard & Garden, Pool, Pet, & Auto BMPs at 15 municipal facilities	General Public
Construction Sites	Jul-10 through Jun-11	Stormwater requirements for construction sites	14	All private construction site contractors are educated on stormwater BMPs as a component of the permitting process. Materials include brochures and/or verbal discussion.	Construction Site Operators

Development Community	Jul-10 through Jun-11	Stormwater requirements for construction sites including planning, grading, drainage, etc.		Educational brochures pertaining to stormwater construction site and retention requirements are made available to the development and construction community in the Development Services office.	Development Community & Construction Sites
E-Bulletin (3Q 2011 E-bulletin)	Aug-11	Hazardous Waste Storage, CFL Guidance, Stormwater Program Information	118	118 E-Bulletins e-mailed to industrial & commercial distribution list. Also posted on COT website.	Industrial & Commercial Businesses
Twitter, Facebook & Channel 11	09-Sep-11	Storm event notification & Pesticide/Fertilizer BMPs	11,000	Facebook - 6,000, Twitter - 5,000, Chanel 11 - Unknown	General Public
Tempe Tardeada	09-Oct-11	Stormwater information for home owners	200	200 (total) Home repair, Yard & Garden, Pet waste, FOG, Auto, & Pool BMPs distributed	General Public & Residential
Restaurant meeting at Tempe Public Works	21-Oct-11	Fats, Oils, & Grease Disposal	7	Tempe Grease Cooperative Presentation	Downtown Tempe Businesses & Restaurants
Gain Night (HOA)	22-Oct-11	Stormwater information for home owners	1,000	1000 (total) Home repair, Yard & Garden, Pet waste, FOG, Auto, & Pool BMPs distributed	HOA & Residential
Valley Forward Educators Night	26-Oct-11	Stormwater information for teachers & residential use	400	400 (total) Home repair, Yard & Garden, Pet waste, FOG, Auto, & Pool BMPs distributed	General Public & Schools
ASU Homecoming Block Party	29-Oct-11	Stormwater information for residential use	200	200 (total) Home repair, Yard & Garden, Pet waste, FOG, Auto, & Pool BMPs distributed	Schools & Residential
E-Bulletin (4Q 2011 E-bulletin)	Nov-11	Exterior building washing BMPs, EPA DEP, Stormwater Program Information	118	118 E-Bulletins e-mailed to industrial & commercial distribution list. Also posted on COT website.	Industrial & Commercial Businesses
Tempe Today Article	Nov-11	Vehicle care BMPs	44,000	Article in the Tempe Today newsletter. Distributed in water bills & available on-line.	General Public, Residential, Industrial & Commercial
Tempe Brickyard Management & Tenants	01-Nov-11	Fats, Oils, & Grease Disposal	4	Tempe Grease Cooperative Presentation	Downtown Tempe Businesses & Restaurants
Downtown Tempe Restaurant Owners	26-Jan-12	Fats, Oils, & Grease Disposal	1	Tempe Grease Cooperative Presentation	Downtown Tempe Businesses & Restaurants
E-Bulletin (1Q 2012 E-bulletin)	Mar-12	Stormwater Pollution Prevention & Stormwater Program Information	120	120 E-Bulletins e-mailed to industrial & commercial distribution list. Also posted on COT website.	Industrial & Commercial Businesses
ASU off-Campus Student Housing Fair	07-Mar-12 & 08-Mar-12	Stormwater information for residential use	200	200 (total) Home repair, Yard & Garden, Pet waste, FOG, Auto, & Pool BMPs distributed	Schools & Residential

Running for World Water (Kiwanis Park)	17-Mar-12	Stormwater information for home owners	100	Home repair, Yard & Garden, Pet waste, FOG, Auto, & Pool BMPs distributed	General Public
Green Business Expo (event at 6th St. Park to celebrate green products, services & research)	11-Apr-12	Fats, Oils, & Grease Disposal & Stormwater information for residents & businesses	250	**Copies of SWMP for review and discussion.** Tempe Grease Cooperative information & Home repair, Yard & Garden, Pet waste, FOG, Auto, & Pool BMPs distributed.	Downtown Tempe Businesses & Restaurants & Residential
Tempe Today Article	Jun-12	Copper & E-coli in stormwater, prevention & BMPs	44,000	Article in the Tempe Today newsletter. Distributed in water bills & available on-line.	General Public, Residential, Industrial & Commercial
E-Bulletin (2Q 2012 E-bulletin)	Jun-12	Copper in stormwater, prevention & BMPs, Stormwater Program Information	126	126 E-Bulletins e-mailed to industrial & commercial distribution list. Also posted on COT website.	Industrial & Commercial Businesses
			106,898	**Estimated annual total of people or businesses reached through 19 awareness and outreach activities.**	

Regional Activities

The City of Tempe is an active member of Stormwater Outreach for Regional Municipalities, known as STORM. STORM is a regional organization promoting stormwater quality education within the greater Phoenix metropolitan area and was founded in 2002, in response to regulations requiring municipalities to implement measures to educate the public on ways to protect the quality of stormwater runoff. Benefits for the region include increased public awareness of the impacts of stormwater pollution, shared experience and knowledge, pooled financial resources to address concerns common to all communities, protected environments, and improved quality of life.

The STORM organization is composed of 22 members and benefits small, medium, and large municipalities throughout the greater Phoenix metropolitan area. It has brought together the experience and resources of Phase I MS4s, including Phoenix, Mesa, Tempe, Glendale, Scottsdale, and Arizona Department of Transportation (ADOT) with the Phase II MS4s of Apache Junction, Avondale, Chandler, El Mirage, Fountain Hills, Gilbert, Guadalupe, Goodyear, Luke Air Force Base, Maricopa County, Paradise Valley, Peoria, Surprise, Tolleson, Youngtown, and Flood Control District of Maricopa County (FCDMC). All members are encouraged to participate at meetings that are held on the third Tuesday of each month.

STORM key accomplishments for fiscal year 2011-2012 include the following:

- Continue to use “Only Rain in the Storm Drain” motto, expressing a common regional theme that is easily understood and clearly communicates the essential message of keeping pollutants out of the storm drain system.

- Maintain the web site located at http://www.azstorm.org, which relays our message in both English and Spanish. Details of web site activity are included in the FY 2012 STORM annual report on pages five and six, which show a total number of 6,078 hits on the site during the period from July 2011 through June 2012. The website is updated as needed.

- Movie Theater Campaign - STORM's FY 2012 movie theater campaign began November 18, 2011, to January 5, 2012, and ran for seven weeks to correspond to the winter rain season. The movie theater campaign was shown at seven theaters throughout the Phoenix metropolitan area, showing on 131 movie screens. Based upon historical movie admission rates, it is estimated that the campaign was shown to approximately 1,183,000 people. STORM spent $10,000 for the movie theater campaign in FY 2012.

- Radio Campaigns - STORM conducted two radio ad campaigns during FY 2012. The first campaign aired a PSA regarding the application of pesticides, herbicides, and fertilizers and ran on ten radio stations from September 5, 2011, to October 23, 2011 (seven weeks). The PSA audience, age 12 and above, was estimated at 3,193,200. The cost of the campaign was $9,585.84.

  The second campaign included a PSA on the importance of maintaining vehicles to prevent pollution from leaking fluids. This PSA aired on ten stations from May 7, 2012, to June 24, 2012, for seven weeks and the estimated audience, age 12 and above, was 3,093,800. The campaign cost $4,156.11.

  Both campaigns were aired in English and Spanish and are posted on the website at http://www.azstorm.org/radio-psa/.

- On April 24, 2012, STORM and the Arizona Department of Transportation held the 2nd Annual Maricopa County Stormwater Construction Seminar. The Arizona Department of Transportation provided the seminar room at no charge and STORM provided refreshments. This seminar featured presentations by member municipalities, as well as county and state agency representatives, regarding the AZPDES regulatory requirements unique to construction sites within Maricopa County. The seminar had approximately 50 attendees. The presentation and handouts from the seminar are posted on the website at http://www.azstorm.org/construction-seminar/.

- Display boards continue to be used at community outreach events to convey the difference between the sanitary sewer and storm sewer systems to the public, including suggestions for avoiding adding pollutants to the stormwater system. These display boards were utilized by several STORM members at various events

listed in Attachment B of the FY 2012 STORM annual report. Table banners continue to be used during this fiscal year to depict the STORM name, logo, and website.

- Promotional Items - Various promotional items have been previously developed with STORM's logo, website address, and/or mission statement. These are made available to members to distribute at local events. STORM expended $9,340.22 on promotional items for FY 2012.

- Additionally, STORM had some promotional items left over from FY 2011 that were used during this fiscal year. STORM continues to distribute bags-on-board for pet waste and Storm Drain Dan coloring books. Two brochures were distributed to convey information for preventing stormwater pollution, "Stormwater Pollution Prevention Begins with You!" and "Stormwater Pollution Prevention for Construction Sites."

The FY 2012 STORM annual report can be found in **Attachment B**.

B. Public Involvement Activities Including Outreach

"Adopt-A" and Other Volunteer Programs

Tempe implements various City "Adopt-A" and other volunteer programs as components of the public involvement and participation portion of the City's stormwater program. In addition to the aesthetic value of these programs, the public and community service workers have helped Tempe to remove an estimated 7,818 bags of trash and debris that could have otherwise ended up in the MS4 system and/or subsequently a Water of the U.S. Information on Tempe's "Adopt-A" programs can be found at the website listed below.

- http://www.tempe.gov/publicworks

Table 2 summarizes the number of events that occurred during the 2011-2012 reporting year, number of participants, and amount of trash removed.

Table 2: Summary of "Adopt-A" and Volunteer Involvement and Participation

Events	Events	Volunteers or Community Service Workers Involved	Bags of Trash Removed
Tempe Adopt-A-Street	23	250	144
Tempe Adopt-A-Park/Other Volunteer Programs	248	7,557	7,648
Tempe Adopt-A-Path	5	25	26

Totals	**276**	**7,832**	**7,818**

Open Meeting Events

Upon approval of the SWMP, Tempe must, at least biannually, incorporate "open meeting events" into community activities or other public events. These open forums will be used for public education, input, and feedback on the City's stormwater management program. Tempe's SWMP was approved by ADEQ on June 14, 2012, (notification of the approval was received by Tempe in July) leaving inadequate time for formal 2011-2012 open meeting events; however, since many of Tempe's stormwater awareness and outreach activities/events occur during community activities and public events and are hosted by City staff that are experienced with Tempe's program, "open meeting events" did actually occur prior to the SWMP approval. These events allow for constructive dialog and public input and feedback on the program. Tempe will continue this approach during the 2012-2013 reporting year.

Parks

Tempe's Parks Maintenance Section continues to maintain 65 "doggy bag" dispensers at various Tempe parks. This activity specifically involves the public in the reduction of pet waste that has a potential to reach the MS4.

Communication and Public Reporting

Tempe continues to provide the public with the opportunity to participate actively in the City's stormwater program by providing avenues for the reporting of spills, discharges, or illicit dumping within the community. Tempe continues to operate its stormwater hotline and web-reporting form for public reporting of illegal discharges to the City's storm drain system and, in an effort to consolidate City service information and contacts, during the 2011-2012 reporting year, Tempe implemented a 311 system, which allows residents to call the 311 number or go to the 311 website to report potential illicit discharges. A summary of public reporting events can be found in Section 3.C of this report. Means of reporting are as follows:

- 480-350-2811
- http://www.tempe.gov/stormwater
- 480-350-4311
- http://www.tempe.gov/311

In addition, Tempe regularly disseminates the general Environmental Services Section phone number and stormwater webpage for purposes of allowing public discussion of stormwater issues and providing copies of stormwater material and the most current SWMP. The general contact number and program information location are as follows:

- 480-350-2678
- http://www.tempe.gov/stormwater

Participation is encouraged during outreach events and public awareness activities, and contact information is provided with all outreach materials. See Section 3.A of this report for detailed outreach events.

Household Products Collection Center

Tempe continues to operate its Household Products Collection Center (HPCC), which opened in 1999. The HPCC provides Tempe residents with an outlet for disposing of and recycling potentially hazardous household products. Materials commonly collected at the facility include batteries, used motor oil, paint, antifreeze, pesticides, herbicides, and solvents. Materials are either recycled or disposed of in accordance with local, state, and federal regulations. Usable materials, such as paint, are processed, packaged, and made available to Tempe residents free of charge. Information on the HPCC, and on the proper handling and disposal of household waste, is available at:

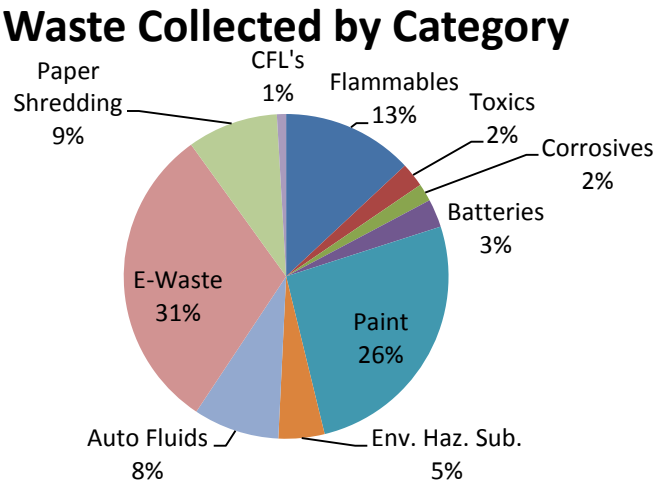
- http://www.tempe.gov/index.aspx?page=188

Table 3 summarizes HPCC events during the 2011-2012 reporting year.

Table 3: Summary of HPCC Activities

Number of Days Open to the Public	Number of People that Utilized HPCC Services	Amount of Household Hazardous Waste Collected
104	7960	332,002 pounds

Below is a breakdown of waste collected, of which there was a 90% recycle rate.



C. Illicit Discharge Detection and Elimination (IDDE) Program Activities

Tempe's IDDE program consists of several components designed to educate, involve, and solicit participation from City employees and the public; proactively prevent illicit discharges; and detect and eliminate illicit discharges. Below is a summary of these IDDE related components.

Training

During the 2011-2012 reporting year, Tempe filled a vacant Environmental Compliance Inspector position, resulting in a total of seven inspectors in Tempe's Environmental Services Section. All inspectors are cross trained in pretreatment, cross connection, and stormwater inspections. During the 2011-2012 reporting year, stormwater training of this group consisted of three separate training events attended by nine employees (seven Environmental Compliance Inspectors, one Environmental Compliance Supervisor, and one Environmental Quality Specialist). The training was held on May 31, 2012, (two events) and June 14, 2012, and encompassed detailed industrial, commercial, and post-construction related topics and was attended by all Tempe inspectors that currently conduct IDDE inspections and enforcement. This training was provided in webinar format by National Stormwater Center (http://www.npdes.com/). IDDE-specific training was not conducted for this group this year; however, training has been provided during the 2012-2013 reporting year as required by the Permit.

Of the 203 Tempe employees that received training during the 2011-2012 reporting year, approximately 136 field employees received Municipal Facility training that included the identification and reporting of illicit and non-stormwater discharges. IDDE topics were discussed during these Municipal Facility training events, though are not specifically categorized as IDDE training for purposes of this report. See Section 3.K of this report for a summary of training events, number of employees trained, and topics discussed. See **Attachment C** for copies of training sign-in sheets.

These Tempe employees, many of whom work in the field, have been specifically trained to contact Tempe's Environmental Services Section in the event that a potentially illicit discharge is identified.

Outreach – Pollution Prevention

Tempe continues to implement a comprehensive outreach program that conveys a message of pollution prevention and encourages the reporting of illicit discharges or other potential sources of stormwater pollution. For details of this program, please see Sections 3.A and 3.B of this report.

Infrastructure Inspection and Maintenance

One of Tempe's most proactive IDDE activities involves municipal stormwater infrastructure inspection and cleaning activities. These activities are divided between five City workgroups: Environmental Services, Parks Maintenance, Streets, Water Engineering, and Utility Services. Each section maintains responsibilities for various aspects of stormwater infrastructure inspection and cleaning. Note that infrastructure is not limited to catch basins, but includes all aspects of the MS4 such as catch basins, drywells, bubbler boxes, inlet structures, outfalls, streets, conveyance pipes, retention basins, etc. Outfall inspections will be covered further in this section.

- Environmental Compliance Inspectors continue to conduct Alternative Retention Criteria Area (ARCA) catch basin inspections after large downtown events such as 4th of July festivities and the Tempe Arts Festival. See Section 3.G of this report for ARCA description. During the 2011-2012 reporting year, four ARCA area catch basin inspection events occurred. As a result, 76 catch basins were inspected, of which 46 were referred for cleaning.

  In addition to the ARCA inspections, Environmental Compliance Inspectors conducted catch basin inspections in various other sections of the city as a result calls or complaints. As a result of these inspections, an additional 49 inspections were completed, of which 36 were referred for cleaning.

  In response to an Arizona Department of Transportation (ADOT) IDDE investigation request dated April 4, 2012, Tempe conducted dry weather flow investigations in drainage areas that have a potential to discharge to ADOT's MS4 and, ultimately, an ADOT Outfall. On May 2 and May 4, 2012, a Tempe Environmental Compliance Inspector documented 13 visual infrastructure inspections at areas within Tempe's MS4 that best represented potential downstream collection points prior to entry into ADOT's MS4. No evidence of existing or recent dry weather flows were identified in the areas inspected. During these inspections, the general area was also surveyed for signs of aboveground illicit discharges and dry weather flows. None were identified.

  A numeric summary of these inspection events can be found in Table 4, further in this section. Inspection forms, narratives, and correspondence can be found in **Attachment D**. A summary of contracted cleaning events can be found in **Attachment E**.

- Tempe's Parks Maintenance Section provides routine maintenance for various parks, retention areas, public common areas, public open areas, and recreational areas throughout the city. During routine visits to each of these facilities, cursory inspections are conducted of stormwater infrastructure. Detailed inspections are

conducted annually. During the 2011-2012 reporting year, the Tempe Parks Maintenance Section inspected 256 pieces of City stormwater infrastructure including catch basins, inlet structures, drywells, bubbler boxes, and retention basins. Of the 256 inspections, 34 components were referred for cleaning. A numeric summary of these events can be found in Table 4. Inspection forms can be found in **Attachment F**. A summary of contracted cleaning events can be found in **Attachment E**.

- Tempe's Street Maintenance Section is, in part, tasked with the maintenance and cleaning of Tempe streets and various other MS4 components, including street sweeping and routine infrastructure inspections. To reduce the amount of debris entering the MS4, Tempe continues to implement an effective street sweeping program using the following schedule (adherence to this schedule varies occasionally due to unforeseen events that require staff and/or equipment reprioritization):

    - Arterial streets are swept once every two weeks.
    - Residential, Collector, and Industrial streets are swept once every month.
    - City-owned parking lots and large City facilities vary upon condition.
    - Upon request (e.g., water main breaks, emergency road repairs, trackout, special events, etc.)

  During the 2011-2012 reporting year, Tempe cleaned approximately 21,890 linear miles of streets, effectively removing approximately 828.1 tons of debris. A numeric summary of these events can be found in Table 4.

  Streets Maintenance also conducts visual inspections of catch basins and other similar infrastructure. During the 2011-2012 reporting year, this section completed inspections of 258 catch basins over a 246-mile span of Tempe owned and maintained roadway. Of the 258 catch basins inspected, 69 were referred for cleaning. A numeric summary of these events can be found in Table 4. Inspection forms can be found in **Attachment G**.

  In addition to the inspections and cleaning outlined above, two additional street programs are used to conduct cursory infrastructure inspections. Structures located on arterial roadways are inspected as part of the City's right-of-way weed control program and structures located on streets other than arterials are inspected as part of the City's street sweeping program. These inspections are not specifically documented unless further detailed inspection or cleaning is deemed necessary.

- Tempe's Water Utilities Division, Water Engineering Section, currently operates one sanitary sewer CCTV crew. As a component of the MS4 program, this crew is

available to conduct underground infrastructure inspections for any of the above-listed Tempe work groups. When available, this crew also conducts MS4 CCTV inspections. During the 2011-2012 reporting year, Tempe inspected 9057.5 feet of underground MS4 conveyance. Inspection records can be found in **Attachment H**. Roughly half of the inspected areas were found to be in good condition and the remaining areas required cleaning due to debris build-up. As a result of these inspections and other infrastructure inspections, 9,636 feet of sub-surface stormwater infrastructure was cleaned. Linear mileage cleaned, removed debris, and CCTV activities are summarized in Table 4.

- Tempe's Water Utilities Division, Utility Services Section, is responsible for the operation and maintenance of Tempe's water and wastewater infrastructure. On occasion, this section is also requested to perform unique stormwater-related cleaning or maintenance activities. During the 2011-2012 reporting year, this section assisted in one cleaning event resulting in the removal of approximately three tons of debris. This event is included in Table 4.

Table 4: Summary of MS4 Infrastructure Inspections and Cleaning

Location/Description	Infrastructure Inspected		Infrastructure Cleaned		Amount of Debris Removed
	Number	Miles	Number	Miles	Tons
ARCA	76	-	26	-	50.41
Environmental Services (other)	55	-	42	-	
Parks/Common and Rec. Areas	256	-	34	-	
Streets (excluding street sweeping)	258	246	69	-	
Pipe (CCTV)	-	1.72	-	1.8	
Utility Services	-	-	1	-	3
Streets (including street sweeping)	-	-	-	21,888	775.4
Totals	**645**	**247.72**	**172**	**21,890**	**828.81**

Note: Infrastructure includes catch basins, drywells, bubbler boxes, inlet structures, streets, conveyance pipes, etc.

Call-Outs

Tempe's stormwater Permit requires that the City respond to at least 90% of all reported illicit discharges and investigate at least 80% of potential illicit discharges reported by the public. Of the 69 call-outs that Tempe's Environmental Services Section received, 60 were either directly or indirectly related to stormwater concerns. All calls were responded to and investigated. A summary of all call-outs pertaining to these reports can be found in **Attachment I**. Table 5 summarizes the response and investigation percentages.

Table 5: Summary of Potential Illicit Discharge Reports

Reports (hotline, web form, other calls)	Reports Responded To	Percent Responded To	Reports Investigated	Percent Investigated
60	60	100	60	100

Inspections – Municipal, Industrial, Commercial, Outfall

Tempe's stormwater inspection program for municipal, industrial, and commercial facilities is an important component of the IDDE program. Aside from identifying and eliminating discharges, these inspections compel the use of stormwater BMPs, bring awareness to stormwater pollution issues, and ultimately prevent the occurrence of illicit discharges that could impact the MS4 or receiving waters. These specific programs are further summarized in Sections 3.D and 3.E of this report. Tempe's outfall inspection program also serves as an important component of this program. This program is further summarized in Section 3.H of this report.

IDDE Screening Program, Investigations, Identified Sources, and Corrective or Enforcement Actions.

Tempe's IDDE screening program can be initiated by notifications from persons participating in any previously listed components (e.g., public notifications, field staff notifications, inspections, etc.). Regardless of the source, Tempe responds to all reported illicit discharges, except when known to not be a significant source of pollutants or exempt, and initiates investigation of these discharges within three business days of detection or report. If the discharge is found to be illicit, corrective action, including enforcement mechanisms, are used to eliminate the illicit discharge. Identified wastewater discharges, such as raw sewage or grease, are immediately investigated and eliminated as soon as possible. Discharges found to not be a significant source of pollutants, exempt from CWA discharge provisions, or permitted under an ADEQ AZPDES permit are not necessarily investigated each time they are identified (e.g., irrigation water, tail-water, permitted de minimis discharges).

If the source of an illicit discharge cannot be identified through physical investigations and field screening, grab samples will be collected at the outfall or field location where the prohibited discharge occurred and analyzed at a state certified lab. During the 2011-2012 reporting year, all but one discharge was identified through physical investigations and/or field screening. The one discharge for which the source was not identified was inadvertently not immediately investigated, though was screened. All triggers were negative. Based on subsequent mapping review, potential sources are likely tail water connections in the area. As a result of this missed investigation, all inspectors were retrained in outfall screening procedures. Note that further training will be provided to inspectors as a result of Tempe's

2012 Stormwater Audit findings and impending program changes. See Section 5 of this report for detailed audit findings.

Analytical laboratory analysis was conducted as a result of one outfall inspection, though results determined that no parameters were above the applicable Surface Water Quality Standards and the discharge was determined to not be a significant source of pollutants.

As a result of 57 outfall inspections, 122 industrial/commercial inspections, 27 restaurant inspections, and 60 call-outs, Tempe Environmental Compliance Inspectors identified the following.

- Ten outfall discharges were determined to not be sources of pollutants. Further information can be found in Section 3.H of this report.
- Seven potential or actual illicit discharges to the MS4 from industrial/commercial sources resulted in the issuance of seven official warning letters. Of the seven warning letters, three were issued to residents, one was issued to a restaurant, and three were issued to commercial businesses. See **Attachment J**.
- Two illicit discharges to the MS4 from commercial sources resulted in the issuance of two Notices of Violation. Both of the NOVs were issued to restaurants. **See Attachment J**.

Table 6 summarizes Environmental Compliance Inspector investigation and inspection activities.

Table 6: Environmental Compliance Inspector Inspection Summary

Inspection Type	Number of Inspections	Official Findings/Enforcement
Outfalls	57	· Ten dry weather flows (determined to not be significant sources of pollutants.)
Industrial/Commercial (non-restaurant)	122	· Seven Warning Letters
Restaurant	27	· Two Notice of Violation
Call-Out	60	· One Minor corrective actions
ARCA and Other Catch Basins	131	· 42 Catch basin cleanings
Total	**397**	

D. Municipal Facilities

Inventory

Tempe has completed the identification and inventory of municipal facilities ahead of the Permit-required timeline of three years. During the 2010-2011 reporting year, Tempe inventoried 140 facilities. As a result of refining this inventory, Tempe added three

additional facilities during the 2011-2012 reporting year, bringing the total number of facilities to 143. A list of facilities and a map of general facility locations is maintained and kept on file with Tempe's Environmental Services Section and can be reviewed by ADEQ upon request. This inventory is subject to change upon internal annual reviews.

Inspections

Consistent with Tempe's Municipal Facility Stormwater Inspection Program, Tempe has inspected and prioritized all 143 sites. During the 2011-2012 Reporting year, Tempe conducted 114 inspections, five of which required follow-up inspections. Activities needed and performed in response to these inspections are detailed in the *Results* section below. Table 7 summarizes the municipal facility inventory prioritization. As a result of the 2012 Stormwater Audit, the municipal facility prioritization criterion is being modified and will be provided to ADEQ upon completion.

Table 7: Summary of Municipal Facility Priority Facilities

Department/ Division	Priority #1 Facilities	Priority #2 Facilities	Priority #3 Facilities	Number of Facilities
PW-Water	3	11	16	30
Fire	1	8	1	10
Parks	4	3	57	64
Community Services	0	6	11	17
Transportation	1	3	0	4
Police	0	4	2	6
PW-Other	3	0	0	3
Miscellaneous	0	2	7	9
Totals	12	37	94	143

All Priority #1 facilities will be inspected biannually. The Priority #2 facilities will be inspected every three years and the Priority #3 facilities will be inspected every five years. New facilities and those with significant changes in purpose and inventory will be inspected as they come on line or change. Table 8 summarizes all 2011-2012 inspection activities. Inspection reports can be found in **Attachment K**.

Table 8: Summary of Municipal Facility Inspections

Department/ Division	Number of Facilities	2010-2011 Facilities Inspected	2011-2012 Facilities Inspected	2011-2012 Facilities Re-inspected	Overall Percent Complete
PW-Water	30	27	3	0	*100*
Fire	10	0	10	0	*100*
Parks	64	2	62	4	*100*
Community Services	17	0	17	0	*100*
Transportation	4	0	4	0	*100*
Police	6	0	6	1	*100*
PW-Other	3	0	3	0	*100*
Miscellaneous	9	0	9	0	*100*
Totals	**143**	**29**	**114**	**5**	***100***

Results

Results and/or activities and control measures implemented as a result of the 114 inspections conducted in the 2011-2012 reporting year are as follows:

- All inspected facilities that maintain any single container exceeding five gallons of a hazardous material now post or maintain documentation of practices and procedures designed to prevent and respond to spills that may come into contact with stormwater. This document can be found in **Attachment L**. These practices are in addition to Tempe's Hazardous Waste Management Plan (HWMP), which requires the proper handling, storage, transport, and disposal of hazardous wastes associated with municipal operations and facilities.
- During initial facility inspections, basic stormwater awareness practices are discussed with facility representatives. This discussion is separate and in addition to formalized stormwater training.
- The five facilities requiring follow-up/re-inspection implemented various control measures to address issues related to general housekeeping, secondary containment, equipment storage and cleaning practices, bulk material storage, and site runoff. Some of these facilities are currently working on longer term projects to help ensure certain facility activities further limit exposure to stormwater. Below is a summary of site-specific corrective actions.

    - Facility No. 1. Bulk materials (sand, dirt, loam) storage was relocated to a new, contained area. Most of the facility was re-graded and covered with recycled asphalt pavement (RAP) and berms were constructed along the

perimeter. Hazardous material storage was improved and field vehicles are now stored under cover. Disposal of old and unused equipment has occurred. A new equipment wash-down area is under construction.

- Facility No. 2. Bulk materials storage area has been upgraded and new practices have been implemented. Hazardous material storage was improved and field vehicles are now stored under cover. Old and unused equipment has been disposed of. The yard area has been resurfaced with RAP.

- Facility No. 3. Bulk materials storage has been upgraded and further modifications to this area are in process. Disposal of old and unused equipment has occurred. Hazardous material storage was improved.

- Facility No. 4. Minor change requiring the addition of secondary containment for fuel cans was needed. Later, it was decided to remove fuel entirely, leaving the facility with no hazardous material storage. Note, this change reduced the facility from a Priority #1 to a Priority #3.

- Facility No. 5. The bulk material storage area added secondary containment. Disposal of old and unused equipment has occurred. Hazardous material storage has been enhanced.

Chemical Handling, Storage, Disposal Practices, and Spills

Several Permit sections require various plans, documents, or procedures ensuring the proper handling, storage, and disposal of chemicals and response to chemical spills. Tempe's efforts in this area involve several City sections, all of which serve an important role related to the protection of human life and the environment. Below is a summary of activities performed by various City sections.

- **Environmental Services**

  Tempe's Environmental Services Section is responsible for all initial facility stormwater inspections required by the Permit. In part, the purpose of these inspections is to ensure proper housekeeping and the implementation of stormwater BMPs. During these inspections, facility chemical storage practices are reviewed from an environmental protection perspective. Facilities at which any single container exceeding five gallons of a hazardous material is stored are required to post or maintain documentation of practices and procedures designed to prevent and respond to spills that may come into contact with stormwater. This document was designed to provide a simple, easy-to-read message of proper chemical handling, storage, disposal, and spill response practices and was developed by

representatives from Environmental Services, Risk Management, and HPCC. This document can be found in **Attachment L**.

On July 1, 2011, an Environmental Compliance Inspector responded to a minor sludge spill that occurred at a municipal facility (water treatment plant). The spill was cleaned up by City utility crews and did not impact the stormwater conveyance system. Water treatment sludge is considered an inert material (not hazardous). This was the only identified spill at a municipal facility during the 2011-2012 reporting year and is numerically accounted for in Section 4 of this report.

Tempe's Environmental Services Section is also responsible for most City-wide MS4 stormwater training. This training includes the topics of proper chemical handling, storage, disposal, and spill response practices. See Section 3.K for a summary of training events.

- **HPCC**

  HPCC staff provides various levels of support for all aspects of chemical handling, storage, disposal, and spill response practices. The HPCC is a City-wide liaison for the acquisition of necessary spill prevention and response equipment and Tempe's in-house facility for the disposal of chemical wastes. The HPCC also maintains Tempe's Hazardous Waste Management Plan (HWMP). The HWMP was updated on May 11, 2011, to include practices to minimize the exposure of hazardous waste to precipitation. This review was conducted by Tempe's Environmental Health and Safety Supervisor and an Environmental Quality Specialist (EQS) from Environmental Services. The HWMP can be found in **Attachment M**.

  In addition to these responsibilities, during the 2011-2012 reporting year, HPCC staff provided assistance with various municipal facility stormwater BMP needs.

- **Risk Management**

  Risk Management provides support, guidance, and training in areas related to chemical handling, storage, and spill response. All City-wide safety programs are managed by this section and include the City of Tempe Hazard Communication Program, which was developed to inform employees of their "right to know" about all physical and health hazards associated with handling materials that contain hazardous ingredients.

- **Fire Department**

  The Tempe Fire Department provides emergency response services for incidents involving hazardous materials. Stormwater protection is a critical part of emergency response procedures and is included as part of the City's emergency response

training. The Tempe Fire Department's Hazardous Materials Policy addresses containment of hazardous materials as a critical component of spill response procedures.

Pesticides, Herbicides, and Fertilizers

- Tempe has significantly reduced the amount of pesticides and herbicides used by employing integrated pest management practices. However, when pesticide use is needed, established pesticide application best management practices are implemented. These practices were developed in conjunction with Tempe-certified applicators and Tempe's Environmental Services Section. A copy of this plan can be found in **Attachment P**. The plan is reviewed annually by a Parks Maintenance Section representative.

- Tempe's Parks Maintenance Section applies fertilizer to City parks during the growing season using calibrated broadcast spreaders. Application rates are based on recommendations from the University of Arizona Cooperative Extension Turf Grass Research Facility. Soil and tissue analyses are periodically used to confirm or modify application rates. Currently, some parks and the City golf courses can inject liquid fertilizers through programmable irrigation controllers. When fertilizer is applied in this manner, it is done in small applications over several days to reduce or eliminate chemical run-off. In some turf areas, aeration methods are used which allow for better infiltration of water, fertilizers, chemicals, and soil amendments. In addition, all City of Tempe pesticide applicators are licensed through the Arizona Office of Pest Management, and are required to complete continuing education units (CEUs) every year which include training on best management practices.

- Tempe maintains Areawide AZPDES Pesticide General Permit coverage for the application of pesticides and herbicides to City-owned and operated urban lakes. Tempe does not conduct the actual application of pesticides to these water bodies, rather, applications are conducted by contracted pesticide applicators that are licensed through the Arizona Office of Pest Management. All contracted applicators are required to comply with PGP conditions and Tempe-specific provisions.

MSGP (and other AZPDES) Tracking

Two Tempe-owned and/or operated facilities currently maintain coverage under the MSGP and two additional facilities maintain NECs. No other facilities have been identified as requiring permitting under the MSGP. Tempe identifies facility environmental regulatory requirements when operations at an existing facility change or new facilities are constructed. Tracking of MSGP and various other ADEQ and EPA regulatory requirements occurs electronically through a compliance management solution known as Intelex (http://www.intelex.com/).

Inventories and Mapping

Tempe's Permit contains a series of inventory and mapping requirements with various completion dates ranging from the submittal of the first annual report to the fourth year annual report. Table 9 summarizes Permit mapping requirements that have been met, the reporting year in which they were completed, and the map title. These maps were created with existing mapping capability and will be updated to reflect changes and Permit requirements where needed. A status of "fourth year annual report" mapping capability is provided later in this section. During the 2011-2012 reporting year, the "Tempe MS4 Major Outfall" map was updated to reflect a newly identified outfall (SR-26). All maps are maintained on file with Tempe's Environmental Services Section and can be reviewed by ADEQ upon request. Note that all other inventories are addressed in their respective reporting sections.

Table 9: Summary of Mapping Status

Map Description	Reporting Year Map Completed or Updated	Map Name
Identification and mapping of waters of the U.S. (including Tempe area canals) that may receive discharges from the MS4	2010-2011	Tempe MS4 Surface Waters
An up-to-date map or map(s) showing MS4 boundaries.	2010-2011	All Maps
An up-to-date map or map(s) showing locations where Tempe's storm sewer discharges to waters of the U.S.	2010-2011	Tempe MS4 Monitoring and Discharge Locations, Tempe MS4 Drainage System
An up-to-date map or map(s) showing wet weather stormwater monitoring location(s) and the associated drainage basins. (Including acreage and land uses).	2010-2011	KP-01, SR-05, SR-08, TD-01, TD-03 Stormwater Monitoring Location Fact Sheets
Map of all major outfalls and other field screening points.	2011-2012	Tempe MS4 Major Outfalls
Map of facilities owned or operated by the MS4 that have the potential to discharge pollutants to waters of the U.S.	2010-2011	Tempe MS4 Municipal Facilities
An up-to-date drainage system map.	2010-2011	Tempe MS4 Drainage System
Drainage Basins	2008-2009	Tempe MS4 Stormwater Basins
ARCA	2007-2008	Tempe ARCA

- **Linear Drainage Structures**

  Line layer showing the location of all stormwater system pipes and the direction of stormwater flow.

  Status: Tempe's mapping system currently maintains this capability and is part of the process of mapping Engineering as-builts.

- **Storm Drain Inlets and Catch Basins**

  Point layer showing the location of all storm drain inlets and catch basins.

  Status: Tempe's mapping system currently maintains this capability and is part of the process of mapping Engineering as-builts. Changes to storm drain inlets or catch basins outside of the Engineering construction and as-built processes will need to be identified and linked as well. If modifications are needed by the fourth year annual report, they are expected to be minimal alterations or adjustments.

- **Outfalls**

  a) Point layer showing the location of all outfalls.
  b) Polygon layer showing the drainage area associated with each of the monitored outfalls identified in Table 1 of the Permit.

  Status: 90% complete. Some fine tuning is needed to make this into an active GIS mapping maintenance process as well as identifying and linking to triggers when outfalls are created, altered, or removed. The expected completion date is December 31, 2013.

- **Detention/Retention Basins**

  Point or polygon layer showing the locations of all identified City-owned retention and detention basins that are connected to the municipal stormwater conveyance system (i.e., that receive drainage from or discharge to a stormwater conveyance).

  Status: 99% complete on an interim system. A redesigned system that is part of the mapping maintenance process and linked to business activities outside of Engineering construction and as-built processes will need to be developed. The expected completion date is December 31, 2013.

- **Jurisdictional MS4 Boundary**

  Line or polygon layer showing the jurisdictional boundaries of the MS4, including any new land annexations during the Permit term.

  Status: Tempe's mapping system currently maintains this capability and is part of the mapping maintenance processes. If modifications are needed by the fourth year annual report, they are expected to be minimal alterations or adjustments.

Tempe is also required to complete a study that evaluates the cost, method, and time it will take to complete future potential mapping requirements outlined in Appendix A, Section IV.E (second measurable goal). Results of this evaluation will be provided no later than the fourth year annual report.

E. Industrial Facilities

Status of Identification and Inventory of Industrial/Commercial Facilities

The City of Tempe Environmental Services Section has developed an inventory of all industrial and commercial facilities within the city that are subject to inspection under Tempe's MS4 Permit. This inventory was developed using the following Permit-required criteria:

- Industrial facilities identified in 40 CFR 122.26(d)(2)(iv)(C);
- Industrial facilities subject to MSGP requirements, including those facilities that have submitted a no exposure certification; and
- Other industrial and/or commercial sources (or categories of sources) Tempe determines are contributing a substantial pollutant load to the MS4.

The inventory for SARA Title III and MSGP Facilities was developed by acquiring information from the following sources (See **Attachment O** for listing of these facilities):

- Arizona State Emergency Response Commission – (Tempe facilities subject to SARA Title III) – 361 Facilities
- InfoGroup, Government Division – ReferenceUSAGov Data Base (Tempe facilities subject to MSGP as identified in 40 CFR 122.26[b][14][i,ii,iv-ix, xi]) – 359 Facilities

Other sources used to identify industrial and/or commercial sources (or categories of sources) Tempe determines are contributing a substantial pollutant loading to the MS4 are:

- Utility Billing Records
- Multi-media inspections conducted by Environmental Compliance Inspectors

The inventory of SARA Title III and MSGP facilities is duplicative in many respects and is inclusive of facilities within Tempe that are subject to industrial pretreatment permitting requirements. Industrial pretreatment facilities are prioritized for annual stormwater inspections. In addition to the above-listed facilities, Tempe has added restaurants as a "category of sources" with a potential to impact the MS4. As such, all inspected restaurants have been evaluated for stormwater compliance.

Overview of Inspection Findings and Significant Findings

Tempe Environmental Compliance Inspectors conducted stormwater inspections at 122 industrial/commercial facilities subject to SARA Title III, MSGP, and Industrial Pretreatment requirements; and 27 restaurants. Restaurants were inspected for compliance with stormwater requirements along with other regulatory programs. As a result of these

inspections and call-out inspections, findings ranged from minor to significant. Minor findings such as inadequate use or lack of BMPs, or inadequate material/chemical storage, rarely resulted in enforcement escalation and were usually quickly addressed by the inspected entity. The most significant findings related to illicit discharges of grease/oil, contaminated wash water, and contaminated fire system sprinkler water. These findings resulted in the corrective and enforcement actions discussed below. Industrial/commercial inspection documentation can be found in **Attachment P,** and restaurant inspection documentation can be found in **Attachment Q**.

Tempe considers the following factors to have contributed to the relatively low number of significant stormwater violations:

- Most facilities for which minor needs were identified (e.g., inadequate BMPs or control measures) were provided an opportunity to correct deficiencies prior to being subject to formal enforcement action. Most entities took advantage of this opportunity.
- Tempe provides a wide array of industry-specific stormwater educational and awareness outreach to industrial and commercial businesses within the city.
- Many of the inspected facilities subject to SARA requirements maintained chemicals indoors, where stormwater exposure was not a concern.
- Many of the inspected facilities subject to MSGP coverage conducted indoor operations/activities and maintained chemical storage indoors.
- Many of the industrial pretreatment program facilities have been inspected for Tempe stormwater compliance on numerous occasions and have previously corrected any identified deficiencies.

Corrective and Enforcement Actions Needed & Taken in Response to Inspections

During inspections, Tempe inspectors identified the need for a minor corrective action that did not escalate into formal enforcement action. This correction was addressed shortly after the inspection and was verified by the inspector. As a result of inspections conducted during the 2011-2012 reporting year, Tempe inspectors required one minor corrective action.

Findings requiring formal enforcement due to illicit discharges resulted in two violation notices and four warning letters to restaurants or commercial businesses. See **Attachment J** for warning letters and NOVs.

Note that during these inspections, Tempe identified 34 facilities that may have been eligible for coverage under the MSGP but did not demonstrate coverage or an NEC. As a result, Tempe provided ADEQ with information for these potential non-filers on January 18, 2012, and July 12, 2012. See **Attachment R** for copies of non-filer notifications.

F. Construction Program Activities

Status

Tempe's stormwater construction program is managed by the Public Works Engineering Division and encompasses plan review, inventory, prioritization, inspection, and enforcement of private and Capital Improvement Project (CIP) construction projects that will result in a land disturbance of one acre or more, and those that disturb less than one acre, but are part of a larger common plan of development. For the 2011-2012 reporting period, Tempe has reviewed and inventoried 100% of all construction projects meeting the land disturbance criteria. As of June 30, 2012, Tempe has identified 11 private and four CIP projects requiring review inventory, prioritization, and inspection. Inspection documents can be found in **Attachment S**.

Inspection Findings

During the 2011-2012 reporting year, Tempe conducted 19 stormwater inspections of 14 qualifying construction sites. Note that the number of inspected sites does not necessarily reflect the number of sites inventoried or prioritized since the annual inspection requirement is a "rolling" target based upon the project's grading and drainage permit issuance. No significant findings were observed, however three minor corrective actions were required. These actions are described below.

Corrective Action and Enforcement

Three inspections resulted in minor corrective actions. Consistent with internal procedures for progressive action, these corrective actions resulted in verbal notifications to the construction site representative and were documented on inspection documents. Corrections consisted of the need for site runoff BMPs, landscaping stockpile BMPs, and replacement of wattles due to a rain event. All corrections were made and escalating enforcement was not required.

No non-filers were identified. The Tempe Engineering Division requires proof of ADEQ's CGP AZPDES NOI Authorization from the project's owner or developer prior to issuance of a grading and drainage permit and therefore does not anticipate the identification of non-filers.

Training

Three stormwater training events, for employees directly involved with construction activities, occurred on July 14, 2011; April 24, 2012; and June 27, 2012. See Section 3.K of this report for a summary of training events, number of employees trained, and topics discussed.

G. Post-Construction Controls

Summary of Controls

Consistent with EPA's Low Impact Development (LID) recommendations and urban stormwater Best Management Practices (BMPs), Tempe's most effective post-construction control remains on-site retention as implemented by Tempe's Stormwater Retention Ordinance - Chapter 12, Article IV, of the Tempe City Code. See **Attachment T** for a copy of this ordinance. This ordinance is an effective control measure by providing containment for much of the rainfall in Tempe, and accordingly limiting discharges of pollutants to waters of the United States. Tempe's Stormwater Retention Ordinance has been in effect since 1967 and was modified in April 2004 to accommodate more dense development in and around downtown Tempe and the Rio Salado corridor, an area designated as the Alternative Retention Criteria Area (ARCA). Outside the ARCA, all new development or substantial improvements to existing developments must provide storage of sufficient volume (i.e., on-site retention) to hold the runoff from the 100-year design storm. Inside the ARCA, new development or substantial improvements to existing developments must provide on-site retention for the two-year design storm. The two-year requirement may be waived within the ARCA subject to approval by the City of Tempe Public Works Director if equivalent best management practices for on-site pollutant removal are implemented.

Overview of Program

Post-construction inspections are conducted on 100% of all permitted residential, commercial, and CIP projects that result in a land disturbance of one acre or more, and those that disturb less than one acre, but are part of a larger common plan of development. These post-construction inspections are part of the warranty period inspections and occur within twelve months after completion of construction. The inspections provide an opportunity to identify corrective action to be implemented by the developer or responsible contractor for a variety of items, including stormwater and/or drainage controls. Stormwater control measures can utilize one feature or a combination of several features. These control measures will be examined during post-construction site inspections for which an ADEQ NOI is required.

Corrective Action and Enforcement

As of June 30, 2012, four qualifying construction sites have completed construction and received post-construction inspections. No corrective or enforcement actions were needed or taken during this reporting period. Post-construction inspection documents can be found in **Attachment S**.

New or Revised Post-Construction Requirements

Since Tempe's last annual report, there have been no new or revised post-construction requirements related to permits the City issues. Tempe will not issue a grading permit, building permit, or a certificate of occupancy to an owner/developer until notification from the City Engineer is received indicating that a drainage plan and on-site grading and drainage improvements are in compliance with Chapter 12, Article IV, of the Tempe City Code. In addition, the City Engineer will not issue this notification unless a project provides the required retention or unless the project is in the ARCA and the Public Works Deputy Director has approved alternative on-site pollutant removal BMPs. Sections 12-71 and 12-73 of Tempe's on-site retention ordinances contain the administrative requirements that ensure implementation of this program.

H. Outfall Inspection Program

Staff training

No training specific to Outfall inspections occurred during the 2011-2012 reporting year; however, such training has already occurred during the 2012-2013 reporting year. Further training will be provided to inspectors as a result of Tempe's 2012 Stormwater Audit findings and impending program changes. See Section 5 of this report for detailed audit findings.

Outfall inventory

Tempe has identified 42 major outfalls as defined by 40 CFR 122.26. This is an addition of one outfall since the 2010-2011 reporting year. The additional outfall has been added to Tempe's outfall inventory, priority inspection list, and outfall map. This map is maintained on file with Tempe's Environmental Services Section and can be reviewed by ADEQ upon request. The number of major outfalls is subject to change based upon system changes or the identification of previously unidentified outfalls.

Of these 42 major outfalls, 19 are identified as priority outfalls. This priority is based upon receiving water, history of illicit discharges or non-stormwater flow over the last five years, or any cause for prioritization identified by the City. The number of priority outfalls has increased by four as a result of inspections conducted during the 2011-2012 reporting year. The number of priority outfalls is subject to change based upon changes in receiving water designation, detection of illicit discharges that have not been eliminated or shown to be a significant source of pollutants, elimination of illicit discharges, confirmation that non-stormwater flows do not contain a significant source of pollutants, or other factors.

Inspection Tracking System

All major outfalls are inspected annually, and all priority outfalls are inspected semi-annually. If prohibited discharges are identified, inspection frequencies may be increased to

quarterly. Each Environmental Compliance Inspector is assigned designated outfalls and is responsible for inspections at the required frequencies. Once inspections are completed, field data forms are provided to the Environmental Compliance Supervisor for review, after which, all forms are scanned, entered into Tempe's document tracking system, and separately provided to an Environmental Quality Specialist for MS4 Permit tracking and reporting.

Inspection and Screening Procedures

Outfall inspections are conducted utilizing standard field screening procedures and are typically completed when rainfall, temperature, and moisture are lowest, but may be conducted at any time in dry weather conditions.

For each outfall or field screening point, the following information is recorded on an individual screening log:

- **General Information**
    1. Date and Time of Inspection.
    2. Name of Inspector.
    3. Outfall Location/Description/Condition.
        a. Outfall ID and description (MH, channel, outfall, etc.).
        b. Location description if not an outfall (GPS Coordinates).
        c. Structural integrity of MS4 component.
    4. Time since last measurable rain event and approximate amount (> or < 72 Hours).
    5. Watershed Use (industrial, commercial, residential, etc.).
    6. Estimated Flow Rate (if flow exists).
    7. If flow exists, determine if flow has already been shown not to be illicit or a significant source of pollutants.
        a. If yes, document finding (i.e., tail water, TTL bypass, dechlorinated pool backwash, etc.), conduct any field screening the inspector feels may be relevant and complete inspection report.
        b. If no, continue with full analysis of physical and chemical observations.

- **Physical/Chemical Observations**
  If further screening is needed based upon General Information findings, the parameters in Table 10 will be observed or field tested and documented.

Table 10: Physical/Chemical Observations

Parameter/Analyte	Method	Trigger
Color	Visual	"Off-Color"
Odor	Visual	Chemical, gas, or sulphur
Clarity	Visual or Field	Highly Turbid
Floatables/Oil	Visual	Presence of solid or liquid floatables or sheen
Stains/Deposits	Visual	Presence
Biological Growth	Visual	Excessive growth or dead
Temperature	Field	Hot or cold compared to ambient
pH	Field	< 6.5 or >9 S.U.
Total Chlorine	Field	>20 ppb, >4 ppm, depending on SWQS
Copper	Field	Presence
Phenol	Field	Presence
Detergents	Field	Presence

Any flow for which the discharge is not known or at least one analytical trigger is exceeded must be screened again within a 24-hour period with a minimum period of four hours between samples.

- If at the time of the second screening, the flow continues or the analytical trigger is still exceeded, a source identification investigation will be initiated.

- If at the time of the second screening, flow is not detected and the analytical trigger is no longer exceeded, a screening follow-up will occur at the same location within three months. If the three-month follow-up screening does not detect flow or a trigger exceedance, routine screenings at this location will resume. If the three-month follow-up does indicate flow or an analytical trigger exceedance, a source identification investigation will be initiated.

NOTE: Inspection and screening procedures are currently being modified as a result of the 2012 Stormwater Audit. Updated procedures and SWPM modifications will be provided to ADEQ upon completion.

Findings

During the 2011-2012 reporting year, Tempe Environmental Compliance Inspectors conducted 57 outfall inspections. Completed outfall inspection forms can be found in **Attachment U**. Of these inspections, 30 were conducted at priority outfalls.

Of the 11 outfalls that had flow, ten were determined to not be significant sources of pollutants and were identified as either irrigation tail water, irrigation flow, already permitted AZPDES discharge, or runoff coming from the Phoenix Zoo; and one was not investigated, as discussed above.

I. New or Revised Ordinances, Rules, or Policies

Revised Ordinances

Tempe has not developed new or revised existing City Code during the 2011-2012 reporting year, but does envision modifications during the 2012-2013 reporting year. Modifications that are being considered are intended to:

- Provide flexibility on retention requirements for developments that can discharge directly to a Water of the U.S. in compliance with all Clean Water Act and other requirements. Modifications will clarify that such flexibility applies not only when an individual AZPDES permit is issued to the owner/developer by ADEQ, but also when a permit is not required. Ordinance changes will also require retention, BMPs, or other treatment technologies for such discharges to eliminate "first flush" pollutants.

- A prohibition of "first-flush" discharges to Tempe Town Lake.

- Other minor clarifying changes.

Copies of Chapter 12, Articles IV and VI; and Chapter 19, Article IV, of the Tempe City Code can be found in **Attachment T**.

Policies and SWMP

On March 7-8, 2012, the Arizona Department of Environmental Quality (ADEQ) contractor, PG Environmental, LLC, conducted an audit of the City of Tempe Municipal Separate Storm Sewer System (MS4) Program. As a result of audit findings and recommendations, Tempe is currently making modifications to three program components: IDDE Program, Municipal Facility Stormwater Inspection Program, and the Private Construction Inspection Program. Program enhancements will likely result in changes to internal procedural/guidance documents and the SWMP. Changes are expected to be completed by January 1, 2013, at which time the SWMP will be provided to ADEQ for review. See Section 5 of this report for detailed audit findings.

Enforcement Response Plan

Tempe has finished drafting a new Enforcement Response Plan (ERP) as required by the Permit. The ERP consolidates Tempe's pretreatment and stormwater program enforcement

elements and was submitted to ADEQ's pretreatment program for review on August 3, 2012. Adoption by Tempe City Council resolution is anticipated in 2012.

J. Fiscal Expenditures

Tempe's estimated 2011-2012 reporting year expenditures related to implementation of the stormwater program are $1,518,729. A more detailed analysis of fiscal expenditures can be found in Section 12 of this report.

K. Training Summary[1]

Tempe coordinated 13 employee training events covering Permit-required training topics over the course of the 2011-2012 reporting period. A total of 203[2] employees attended these events. Note that Municipal Facility training includes the identification and reporting of illicit and non-stormwater discharges but is not specifically categorized as IDDE training since the training event primarily focuses on pollution prevention and good housekeeping. See training summary in Table 11 for specific training details.

Table 11: Summary of Training Activities

Date(s)	Target Groups	Topic(s)	Permit Training Type	Attendees	Trainer
14-July-11	*Engineering - CIP & Private*	Municipal construction, Erosion and Sediment Controls, Maintenance Requirements for BMPs, Municipal Ordinances Related to Stormwater and Construction, Plan Review Procedures, Grading and Drainage Design Standards, Requirements for Structural and Non-structural BMPs on Construction Sites, Inspection Procedures, Enforcement Procedures, Post-construction Stormwater Controls, Post-construction Inspection Procedures.	Construction/Post-construction	4	Tempe Public Works Engineering
28-Sep-11	*Tempe Management, Supervisors*	Tempe MS4 Permit Conditions, Implementation Progress, Accomplishments, Cross-functional Team Results.	Municipal Facilities	10	Tempe Environmental Services
03-Jan-12	*Tempe Management, Supervisors*	SWMP Executive Review.	Municipal Facilities	10	Tempe Environmental Services

[1] Section added by Tempe to provide a more detailed and centralized summary of training events.
[2] Number includes employees that may have attended more than one training event.

15-Mar-12	*Transportation*	Pollution Prevention; Tempe Code; Spill Management; Handling, Storage, and Transportation of Used Oil & Other Toxic/Hazardous Materials; Permit Requirements including Identifying and Reporting Illicit and Non-stormwater Discharges and Field Practices.	Municipal Facilities	23	Tempe Environmental Services
20-Mar-12	*Solid Waste*	Pollution Prevention; Tempe Code; Spill Management; Handling, Storage, and Transportation of Used Oil & Other Toxic/Hazardous Materials; Permit Requirements including Identifying and Reporting Illicit and Non-stormwater Discharges and Field Practices.	Municipal Facilities	40	Tempe Environmental Services
10-Apr-12	*Parks*	Pollution Prevention; Tempe Code; Spill Management; Handling, Storage, and Transportation of Used Oil & Other Toxic/Hazardous Materials; Permit Requirements including Identifying and Reporting Illicit and Non-stormwater Discharges and Field Practices.	Municipal Facilities	42	Tempe Environmental Services
24-Apr-12	*Engineering - CIP*	Introduction to STORM and Member Requirements; ADOT Stormwater Permit and Management Plan; Construction General Permit 2013 Overview; Site Compliance Inspections, Common Mistakes and Enforcement; Discussion.	Construction/Post-construction	3	AZSTORM
26-Apr-12	*Utilities Services*	Pollution Prevention; Tempe Code; Spill Management; Handling, Storage, and Transportation of Used Oil & Other Toxic/Hazardous Materials; Permit Requirements including Identifying and Reporting Illicit and Non-stormwater Discharges and Field Practices.	Municipal Facilities	31	Tempe Environmental Services
31-May-12	*Environmental Compliance Inspectors, Environmental Quality Specialist, Environmental Compliance Supervisor*	Inspector training; regulated industrial sectors, prioritization; scope of inspections; no exposure exemption; common requirements; SWPPP content; national standards; minimization of exposure; exposure solutions; routine inspections; visual examination; allowable non-stormwater; documentation; annual compliance evaluation.	Industrial Inspections	9	National Stormwater Center
31-May-12	*Environmental Compliance Inspectors, Environmental Quality Specialist, Environmental Compliance Supervisor*	Inspector Training; Inventory, Prioritization; Scope of Inspections; Minimization of Exposure; Restaurants; Retail Gasoline Outlets, Automotive Service Facilities; Exposure Solutions.	Commercial Inspections	9	National Stormwater Center

14-Jun-12	*Environmental Compliance Inspectors, Environmental Quality Specialist, Environmental Compliance Supervisor*	Inspector Training: Post construction; MS4 permit; BMPs; Off-site Mitigation; Federal Programs; the Law; Green Infrastructure; LID; Harvesting, Capture and Reuse.	Post Construction Inspections	9	National Stormwater Center
27-Jun-12	*Engineering - Private Development*	Private Development/CIP, Erosion and Sediment Controls, Maintenance Requirements for BMPs, Municipal Ordinances Related to Stormwater and Construction, Plan Review Procedures, Grading and Drainage Design Standards, Requirements for Structural and Non-structural BMPs on Construction Sites, Inspection Procedures, Enforcement Procedures, Post-construction Stormwater Controls, Post-construction Inspection Procedures.	Construction/Post-construction	6	Tempe Public Works Engineering
27-Jun-12	*Engineering - CIP*	Private Development/CIP, Erosion and Sediment Controls, Maintenance Requirements for BMPs, Municipal Ordinances Related to Stormwater and Construction, Plan Review Procedures, Grading and Drainage Design Standards, Requirements for Structural and Non-structural BMPs on Construction Sites, Inspection Procedures, Enforcement Procedures, Post-construction Stormwater Controls, Post-construction Inspection Procedures.	Construction/Post-construction	7	Tempe Public Works Engineering
Total Number of Training Events:					**13**
Total Number of attendees:					**203**

4. Numeric Summary of Stormwater Management Program Activities

The table below provides a numeric summary of stormwater management practices and activities performed each year.

	Annual Reporting Year (July 1 – June 30)				
Stormwater Management Practice or Activity:	**2010 - 2011**	**2011 - 2012**	**2012 - 2013**	**2013 - 2014**	**2014 - 2015**
Illicit Discharge Detection & Elimination Program					
1. Municipal Employee Training					
Number of training sessions (on non-stormwater discharges and the IDDE program)	**1**	**0**			
Number of employees attending training	**7**	**0**			
2. Spill Prevention					
Number of municipal facilities identified with hazardous materials	**10**	**53**			
Number of spills at municipal facilities with hazardous materials that occurred in outside areas	**0**	**1**			
Number of facility assessments completed *(identify any issues found requiring follow-up in narrative and summarize new practices to minimize exposure*)	**29**	**114**			
Date of last review of HWMP (*identify committee participant with stormwater expertise in narrative*)	**5/11/2011**	**5/11/2011**			
3. Outfall Inspections					
Total number inspected *(attach or forward electronic copy of inventory or map of major outfalls and priority outfalls*)[1]	**77**	**57**			
Number of 'priority outfalls' identified to date	**15**	**19**			

[1] All maps and inventories are maintained on file with Tempe's Environmental Services Section and can be reviewed by ADEQ upon request.

(summarize findings and follow-up actions in narrative)					
Number of 'priority outfalls' inspected[1] *(summarize findings and follow-up actions in narrative)*	**27**	**30**			
Number of dry weather flows detected	**4**	**11**			
Number of dry weather flows investigated	**0**	**10**			
Number of major outfalls sampled[2]	**3**	**11**			
Number of illicit discharges identified	**0**	**0**			
Number of illicit discharges eliminated	**0**	**0**			
Amount (percentage, linear miles, etc.) of storm drain inspected[3]	**2349.5 feet**	**9057.5 feet**			
Number of storm drain cross connection investigations	**0**	**0**			
Number of illicit connections detected	**0**	**0**			
Number of illicit connections eliminated	**0**	**0**			
Number of corrective or enforcement actions initiated within 60 days of identification	**8**	**10**			
Percent of cases resolved within one calendar year of original enforcement action	**8**	**10**			
Number of illicit discharge reports received from public	**36**	**60**			
Percent of illicit discharge reports responded to	**100**	**100**			
Percent of responses initiated within three business days	**100**	**100**			

[1] Number reflects the number of priority outfall inspections.
[2] Includes field screening and analysis.
[3] CCTV inspections only.

Municipal Facilities					
1. Employee Training					
Number of training events *(dates and topics to be included in narrative)*	**6**	**4**			
Number of staff trained	**180**	**136**			
2. Inventory, Map, or Database of MS4 Owned & Operated Facilities					
Total number of facilities on inventory	**140**	**143**			
Date identification of "higher risk' facilities completed	**In process**	**6/20/2012**			
Date prioritization of municipal facilities completed	**In process**	**6/20/2012**			
3. Inspections					
Miles of MS4 drainage system prioritized for inspection	**In process**	**101.5**			
Miles visually inspected[1]	**6.44**	**247.72**			
Number of municipal facilities inspected[2]	**29**	**114**			
Number of 'higher risk' municipal facilities inspected	**0**	**12**			
Number of 'higher risk' municipal facilities found needing improved stormwater controls	**0**	**5**			
4. Infrastructure Maintenance					
Linear miles of drainage system cleaned each year (*City to maintain records documenting specific street cleaning events*)	**13,440**	**21,890**			
Record amount of waste collected from street and lot sweeping (reported in pounds, gallons, etc.)	**714.70 Tons**	**828.81 Tons**			

[1] Includes CCTV and above-ground linear inspections of the drainage system. Does not include cursory street inspections.
[2] This numeric parameter was added by Tempe to provide a more detailed explanation of the municipal inspection program.

Total number of catch basins[1]	**367**	**645**			
Number of catch basins cleaned	**90**	**172**			
Amount of waste collected from catch basin cleaning (tons)	**67**	**50.41**			
Industrial and Commercial Sites Not Owned by the MS4					
Number of training events for MS4 staff	**1**	**3**			
Number of municipal staff trained	**7**	**9**			
Number of industrial facilities inspected[2] (see Appendix A, Part V.B)	**76**	**122**			
Number of corrective or enforcement actions initiated on industrial facilities	**0**	**7**			
Percentage of cases resolved under the ERP within one (1) calendar year of original enforcement action	**N/A**	**N/A**			
Construction Program Activities[3]					
Number of training events for MS4 staff *(include topics in narrative summary)*	**3**	**3**			
Number of municipal staff trained	**13[4]**	**14**			
Number of construction/grading plans submitted for review	**9**	**15**			
Number of construction/grading plans reviewed	**9**	**15**			
Number of construction sites inspected[5]	**9**	**14**			

[1] Inspected, includes other stormwater infrastructure such as drywells, bubbler boxes, inlets, etc.
[2] Number excludes restaurant inspections.
[3] Includes private and CIP activities.
[4] Number updated from the 2011-2012 Annual Report. Redundant counting of staff was removed.
[5] Number may not match review and prioritization number based upon date of grading and drainage permit issuance.

Number of corrective or enforcement actions initiated on construction facilities (*identify the type of actions in narrative summary*)	**0**	**3**			
Post Construction Program Activities					
Number of post-construction inspections completed	**0**	**4**			
Number of corrective or enforcement actions initiated for post-construction activities (*identify the type of actions in narrative summary*)	**0**	**0**			

5. Evaluation of the Stormwater Management Program

In accordance with Section 5.4 of the Permit, this section provides an evaluation of the progress and success of the stormwater management program, including an assessment of the effectiveness of stormwater management practices in reducing the discharge of pollutants to and from the municipal storm sewer system.

The 2011-2012 reporting year represented the first full year of implementation and reporting under conditions of the most recent Permit. Much of the progress during this period consisted of integrating the stormwater program into the municipal framework of day-to-day activities. This integration consisted of ongoing communication between the Environmental Services Section and several City-wide workgroups conducting required activities. As part of this process, Public Works senior management was routinely briefed on the progress and status of program implementation. An emphasis on the establishment of quarterly goals and status updates highlights the City's effort to keep making progress toward full program implementation. All quarterly updates are provided to senior management.

Based upon one full year of implementation, Tempe has also made changes to internal reporting processes that will encourage efficiency and reduce redundant reporting.

Quantifiable program successes include the following:

- SWMP Development.
- Equipment upgrades to the final monitoring stations on September 28, 2011.
- Internal development of a pollutant loading model.
- ERP development (not implemented yet).
- All SWMP numeric goals were met.

During the 2011-2012 reporting year, Tempe has experienced various sampling-related challenges that have prevented the collection and use of analytical data. These challenges are further discussed in Sections 8 and 9. Tempe is in the process of correcting these hurdles and is optimistic that the 2012-2013 reporting year will produce valuable sampling information.

Tempe also had the benefit of an external audit conducted March 7-8, 2012, by the Arizona Department of Environmental Quality (ADEQ) and Environmental Protection Agency (EPA) contractor, PG Environmental, LLC. The final audit report identified 11 "particularly notable" program elements and four potential program deficiencies. Elements of Tempe's MS4 Program that were identified as particularly notable were as follows:

- Overall the City has an effective stormwater program and demonstrated strong leadership from top management.

- Multiple Departments of the City are delegated responsibilities for implementing the stormwater program and these departments appear to embrace their responsibilities.
- The City uses diversified routes and mechanisms for distributing educational materials and conducting outreach, including social media and collaborating with other entities.
- The City has an established industrial pretreatment program providing a fundamental element and good foundation for a successful stormwater program.
- The City has developed an effective illicit discharge detection and elimination (IDDE) inspection program with seven multi-program inspectors who conducted inspections in assigned areas of the City. The staff interviewed during the audit appeared knowledgeable and motivated to prohibit, remove, and respond to illicit connections and discharges in the City.
- The City has established an effective response process and standard operating procedure for responding to reports of potential illegal discharges to the MS4.
- The City's Household Products Collection Center is effectively managing household hazardous waste to ensure proper handling and disposal and further prevent stormwater pollution.
- The City had established a food industry inspection program to ensure proper management of fat, oil, and grease by restaurants.
- The City's Engineering Department is actively involved in plan review and stormwater pollution prevention plan adequacy for Capital Improvement Program (CIP) projects.
- The City demonstrated effective use of best management practices (BMP)s for erosion and sediment control on a CIP project visited by the EPA Audit Team.
- The City's requirement of on-site retention for a 100-year storm event is an effective approach to stormwater pollution prevention.

Program deficiencies identified during the audit were identified as follows:

- The City had not identified appropriate triggers for dry weather screening as part of the IDDE program.
- The City had not fully developed ranking criteria for municipal owned facilities based on the potential to cause a substantial pollutant load.
- Improper pollution prevention practices were noted during site visits at municipal facilities.
- Inadequate and inappropriate use of BMPs to effectively control potential stormwater pollutants were observed at private construction projects.

In response to the audit report, Tempe acknowledged ADEQ's determination of the eleven "particularly notable" program elements and provided a description of actions taken to address potentially deficient findings and timelines for completion of larger program enhancements and/or

updates. All audit corrective actions are scheduled for completion by January 1, 2013. Tempe is confident that the response will address potential deficiencies and is open to continued discussion with ADEQ on the various topics. The March audit resulted in productive dialogue that provided overall value to Tempe's stormwater program.

While implementation of many of these stormwater management practices is assumed to have effectively reduced the discharge of pollutants to and from the MS4, this reduction is not always quantifiable. For example, due in large part to Tempe's on-site retention policy, it cannot be assumed that all debris removed from the system or all waste collected by HPCC would have ended up in a discharge to a Water of the U.S. Tempe will continue to review analytical data in the effort to identify such correlations between pollutant concentration and stormwater management practices.

6. Stormwater Management Program Modifications

In accordance with Section 5.5 of the Permit, this section provides a description of modifications, if applicable, to the stormwater management program each year as follows:

A. Addition of New Control Measures

As a result of the 2012 Stormwater Audit findings and recommendations, Tempe is currently making modifications to three programs: IDDE, Municipal Facility Stormwater Inspections, and Private Construction Inspections. Program enhancements will likely result in changes to internal procedural/guidance documents and the SWMP. Changes are expected to be completed by January 1, 2013, at which point the SWMP will be provided to ADEQ for review. If changes add control measures to the SWMP, Tempe will provide a summary of additions during the 2012-2013 Annual Report.

As required by Permit, Tempe developed and implemented a Stormwater Control Measure Field Manual prior to the respective deadlines of January 2013 and January 2014 (Appendix A.IV.D). See **Attachment V** for a copy of this document.

B. Addition of Temporary Control Measures

Tempe has added temporary control measures related to discharge concentrations of e-coli and copper that were higher than applicable SWQSs. The temporary measures relate to outreach/education message topic and frequency and industrial/commercial inspection focus. See Section 10.C of this report for details.

C. Increase of Existing Control Measures

During the 2011-2012 reporting year, Tempe increased the number of inspection events in the downtown area from two to four. This increase was primarily a result of training staff that had not previously conducted inspections of this type. The increase is not anticipated in the future unless downtown events are determined to have increased the potential for the discharge of pollutants.

For similar reasons, during the 2011-2012 reporting year, Tempe increased the number of miles inspected by the Streets Maintenance Section from 100 to 246 miles, resulting in a significant increase in catch basin and other infrastructure inspections. An increase of this magnitude is not anticipated in the future.

Tempe has increased control measures related to discharge concentrations of e-coli and copper that were higher than applicable SWQSs. The increased measures relate to the increased number of education/outreach activities related to e-coli and copper sampling results. See Section 10.C of this report for details.

Most other numeric increases are parameters that are variable or a reflection of a full year of SWMP implementation compared with the prorated number from the previous year.

D. Replacement of Existing Control Measures

As outlined in subsection A, above, if replacement of existing control measures occurs as a result of program changes, Tempe will provide a summary in the 2012-2013 Annual Report. No such replacements occurred during the 2011-2012 reporting year.

7. Monitoring Locations

This section requires a brief description of each stormwater monitoring location, including the following information. The following information was provided to ADEQ in the 2010-2011 Annual Report.

- Name and description of receiving water
- Outfall identification number
- Address or physical location of the site
- Latitude and longitude
- Size (acres) of the drainage area
- Land uses within the drainage area with an estimated percentage of each use
- Type of monitoring equipment

There has been no change in the information previously submitted to ADEQ. This information is also maintained on file with Tempe's Environmental Services Section and can be reviewed by ADEQ upon

request. Tempe continues to make minor monitoring equipment changes to optimize the accuracy and consistency of each sampling event.

Note: Modifications to monitoring locations will not be implemented without a Permit modification.

8. Storm Event Records

This section requires the following information:

For each monitoring location identified in Section 7.0, Table 1.0 of the Permit, summarize all measurable storm events (0.1 inch or greater) occurring in the drainage area of each monitoring location within the winter and summer wet seasons, respectively, until samples have been collected for the monitoring location. Include the date of each event, the amount of precipitation (inches) for each event, and whether a sample was collected, or if not collected, information on the conditions that prevented sampling. (Note: If unable to collect stormwater samples due to adverse climatic conditions, provide, in lieu of sampling data, a description of the conditions that prevented sampling. Adverse climatic conditions which may prevent the collection of samples include weather conditions that create dangerous conditions for personnel, such as local flooding, high winds, electrical storms, etc.)

Tempe has consolidated the requested information which can be found in **Attachment W.**

Tempe's stormwater Permit was issued on November 24, 2010. On December 30, 2010, Tempe appealed sampling provisions of this Permit, asserting that additional time should be allowed to upgrade sampling equipment at four sampling locations and construct a new monitoring station at one location. Pursuant subsequent discussions resulting from this appeal, ADEQ modified Section 7.3.3 to require Tempe to have a minimum of two of the five sample locations identified in Table 1 of the Permit operational and sampling enabled by June 1, 2011. The remaining sample locations are to be operational and sampling enabled by November 1, 2011. Tempe is also required to "make up" stormwater sampling that could have occurred during the equipment upgrade and construction period. Any needed "make-up" sampling will occur during subsequent summer and winter wet seasons if two measurable storm events occur during those seasons. The total number of sampling events required by the Permit was unchanged by the appeal.

Tempe has successfully met both deadlines for all stations. Below is a summary of sites and completion dates.

- KP-01 – May 18, 2011
- SR-08 – May 19, 2011
- TD-03 – May 19, 2011
- SR-05 – May 20, 2011
- TD-01 – September 28, 2011

Due to challenges with consistent sample collection at all sites, Tempe worked closely with the sampling equipment vendor to develop programming strategies for each site. Most of these challenges have been successfully resolved. Tempe continues to track all sampling events with the goal of successfully completing all missed sampling events. **Attachment X** summarizes sampling status throughout the 2011-2012 reporting year. Note that several successful sampling events that have occurred during the 2012-2013 year are not reflected in this summary.

9. Summary of Monitoring Data (By Location)

During a comprehensive review of all stormwater data, Tempe identified 12 sampling events that warrant the exclusion of data due to questions of data integrity and representativeness (6 events) and permit criteria not being met (6 events). Note that several of these events did not consist of a full collection of all sample sets and the resulting exclusion for those events was minimal. Tempe is reporting all data collected during these 12 sampling events on the applicable Summary of Monitoring Data Sheets (**Attachment Y**), but the data is "flagged" and not used to assess comparisons to water quality standards, permit triggered activities, or loading calculations. Tempe has discussed this situation with ADEQ and is implementing an action plan to ensure greater integrity of sample collection in the future.

Below is a summary of sampling events for which data is reported but not used for other compliance purposes.

Table 12: Summary of Data Exclusion

Sampling Irregularities		
Site ID	Collection Date	Reason for Exclusion of Data
SR-05	07/24/2011	Calculated aliquot volume significantly outside of acceptable standard deviation range.
SR-05	11/05/2011	Calculated aliquot volume significantly outside of acceptable standard deviation range.
SR-08	11/05/2011	Calculated aliquot volume significantly outside of acceptable standard deviation range.
SR-05	11/13/2011	Sampling equipment did not identify the collection of composite sample during this event.
SR-08	11/13/2011	Calculated aliquot volume outside of acceptable standard deviation range.
SR-08	12/13/2011	Calculated aliquot volume significantly outside of acceptable standard deviation range.
Permit Stipulations		
Site ID	Collection Date	Reason for Exclusion of Data
TD-01	11/05/2011	Three-hour sampling window exceeded for grab samples.
TD-03	11/05/2011	Three-hour sampling window exceeded for grab samples.
KP-01	11/05/2011	Three-hour sampling window exceeded for grab samples.
TD-01	12/12/2011	Sample contained a significant amount of non-stormwater flow.

TD-01	03/18/2012	Three-hour sampling window exceeded for grab samples.
KP-01	03/18/2012	Three-hour sampling window exceeded for grab samples.

Attachment Y provides a summary of all monitoring data. All Laboratory Reports can be found in **Attachment Z**. **Attachment X** summarizes sampling status throughout the 2011-2012 reporting year.

10. Assessment of Monitoring Data

A. Stormwater Quality

As a result of data exclusions outlined in Section 9 and the subsequently reduced number of successful sampling events, Tempe does not have enough analytical data to properly assess the quality of stormwater for this report. Tempe anticipates having a much larger set of data for a more comprehensive assessment in the 2012-2013 Annual Report. Tempe has observed the following general trends based upon historical stormwater monitoring data.

- All evaluated VOC, SVOC, and Pesticide analyses have resulted in non-detects. Note that some of these results have a PQL or MDL higher than applicable SWQS. The appropriate designations for these parameters are highlighted in **Attachment Y**.
- The quality of stormwater is relatively consistent between sites despite differing land uses.
- In some cases, concentrations of copper and e-coli are higher than applicable SWQSs.

B. Water Quality Standards (WQS)

Stormwater monitoring data conducted consistent with Permit sampling conditions has been compared to Surface Water Quality Standards (SWQS) for the applicable receiving water and can be found in the forms located in **Attachment Y**. All laboratory results can be found in **Attachment Z.**

The Permit allows for the testing of dissolved metals and collection of hardness data used to calculate corresponding SWQS; however, guidance on how the collection of hardness samples is conducted is not provided. Beginning with the 2012-2013 reporting year, Tempe's approach to collecting ambient hardness data for a perennial water body, for the purposes of SWQS comparison, has changed. During the 2011-2012 reporting year, Tempe collected this information by sampling the applicable water body (Kiwanis Park Lake) at the time of the stormwater event. After evaluation of the hardness data, Tempe has concluded that the water body was under the direct influence of the stormwater discharge and not representative of ambient conditions. In an effort to compare hardness dependent parameters to ambient

conditions, Tempe will now sample this water body during times that stormwater discharges are not occurring. The same practice will be implemented for the effluent dependent water in the Salt River, above Tempe Town Lake.

C. Exceeding a WQS

Tempe has identified two constituents with concentrations greater than the applicable SWQSs. E-coli was found to be higher than the SWQS at four sites and dissolved copper was found to be higher than the applicable hardness dependent standard at two sites. One of these sites experienced a recurrence of copper higher than the SWQS in the same wet season. Please see **Attachment AA** for details pertaining to sampling date, location, impacted receiving water, SWQSs, and results.

Tempe began the implementation of provisions outlined in Permit Section 4.0, related to the recurrence of discharges higher than SWQSs, under the original assumption that four out of the five sampling locations met this criteria for copper and/or e-coli. The exclusion of data (as explained above) has reduced these instances; however, Tempe fulfilled Permit obligations as if all excluded data was valid. Based upon historic monitoring and other Arizona Phase I findings, Tempe expects the continued high copper and e-coli concentrations, so follow-through with these Permit requirements would have likely been needed in the future.

As a result of the copper and e-coli concentrations, Tempe conducted a literature review to determine potential pollutant sources and applicable control measures. Tempe evaluated existing control measures and made the decision to: (1) continue existing measures that related to the specific pollutants, (2) increase the use of control measures, and (3) develop specific temporary control measures focused on the reduction of copper and e-coli in stormwater. Tempe will use the 2012-2013 Annual Report to evaluate the effectiveness of these control measures. Tables 13 and 14 summarize these efforts. Specific education and outreach messaging is summarized in Table 1 and **Attachment A**.

Table 13: Copper Investigation, Evaluation, and Action

Potential Sources of Copper	
Vehicle Brake Pads	CCA pressure treated wood
Mobile Cleaning	Air Emissions
Vehicle Washing and Service	Soil Erosion
Architectural Copper	Irrigation Water
Pool/Spa/Fountain Algaecides	SSO
Pesticides, algaecides, root killers, and fungicides	Cooling Towers
Industrial Use of Copper	Discharges to POTWs
Evaluated Control Measures	
Industrial Inspections - Focus on copper sources and applicable BMPs.	
Evaluate service facilities for automotive waste disposal practices.	
Outreach/Education - Pools, spa, fountain use of copper treatment and discharge practices.	
Outreach/Education - Alternatives for copper bearing pesticides, algaecides, & fungicides.	
Outreach/Education - Proper use of copper bearing pesticides, algaecides, & fungicides.	
Newly Developed/Implemented or Continued Control Measures	
Industrial Inspections - New inspection focus on potential sources of copper. BMPs discussed if applicable.	
Industrial Outreach/Education – New copper focused education and Prevention BMPs directed to industrial users.	
Public Outreach/Education – New copper focused education and Prevention BMPs directed to the general public.	
Public Outreach/Education - Continued BMP focused education and Prevention BMPs directed to the general public.	
General - Continued implementation of IDDE program.	

Table 14: E. coli Investigation, Evaluation, and Action

Potential Sources of E-Coli	
Animal feces (domesticated, wild, farm)	Wastewater treatment plants
Manure	On-site septic systems
Wastewater discharges	Illicit connections
Evaluated Control Measures	
Review of SSO Control Practices	
Maintenance and cleaning of sewers	
Septic tank policies	
Outreach/Education - Clean up after your pet	
Outreach/Education - Feeding wild animals at waterside locations.	
Newly Developed/Implemented or Continued Control Measures	
Review of SSO Control Practices - Continued review of practices related to response and reporting of SSO events.	
Maintenance and cleaning of sewers - Continued implementation of comprehensive sanitary sewer cleaning program.	
Septic tank policies - Continued non-allowance of septic tank use.	
Public Outreach/Education - New E. coli focused education and prevention BMPs directed to the general public.	
Public Outreach/Education - Continued BMP focused education and prevention BMPs directed to the general public.	
Public Outreach/Education - Continued BMP focused on pet waste pick-up in public places.	

11. Estimate of Annual Pollutant Loadings

This section requires the following information:

An estimate of the pollutant loadings each year from the municipal storm sewer system to waters of the U.S. for each constituent listed in Section 7.4 of the Permit detected by stormwater monitoring within the Permit term. Pollutant loadings and event mean concentrations may be estimated from sampling data collected at the representative monitoring locations, taking into consideration land uses and drainage areas for the outfall. Include a description of the procedures for estimating pollutant loads and concentrations, including any modeling, data analysis, and calculation methods. Compare the pollutant loadings estimated each year to previous estimates of pollutant loadings.

During the 2011-2012 reporting year, Tempe completed the development of a new modeling system to be used for the purposes of estimating pollutant loadings. Table 15 provides a summary of this estimation and **Attachment BB** contains information related to the description of procedures used for this analysis. Due to the limited data available for this analysis, Tempe expects the 2012-2013 to be a more accurate "baseline" year for purposes of future loading comparisons.

Table 15: 2011-2012 Annual Pollutant Loading Estimate (tons)

	Gila River	Kiwanis Park Lake	Salt River (above TTL EDW)	Indian Bend Wash	Tempe Town Lake	Salt River + Tempe Ditch
BOD	33.1	3.4	18.1	6.1	16.2	175
COD	97.9	10.1	53.7	18.2	47.9	518
TSS	71.8	7.4	39.4	13.3	35.1	380
TDS	135	14	74.1	25.1	66.2	715
Total Nitrogen	3.55	0.37	1.95	0.66	1.74	18.8
TKN	2.8	0.29	1.6	0.53	1.4	15
Total Phosphorous	0.32	0.03	0.17	0.06	0.15	1.7
Antimony	0	0	0	0	0	0
Arsenic	0.0005	0.0001	0.0003	0.0001	0.0003	0.0028
Barium	0.0171	0.0018	0.0094	0.0032	0.0084	0.09
Beryllium	0	0	0	0	0	0
Cadmium	0	0	0	0	0	0
Chromium	0.0005	0.0001	0.0003	0.0001	0.0002	0.0026
Copper	0.01	0.0011	0.0057	0.0019	0.0051	0.055
Lead	0.0002	0	0.0001	0	0.0001	0.0012

Mercury	0	0	0	0	0	0.0001
Nickel	0.0018	0.0002	0.001	0.0003	0.0009	0.0097
Selenium	0	0	0	0	0	0
Silver	0	0	0	0	0	0
Thallium	0	0	0	0	0	0
Zinc	0.023	0.0023	0.012	0.0042	0.011	0.12

12. Annual Expenditures

Tempe's stormwater program expenditures for the July 1, 2011 – June 30, 2012, reporting period is conservatively estimated to be $1,518,729. Funding for the program comes from Tempe's CIP fund and various Public Works Department general and enterprise funds. Further explanation of these expenditures and funding sources can be found further in this section.

The following factors were considered when developing this fiscal analysis:

- Public involvement and participation programs are not exclusively related to the stormwater program. Accordingly, stormwater expenditures in these areas were either estimated to be one-half of the total operational budget or time and material specific to stormwater activities.
- Most of the operational street sweeping activities are funded as a stormwater program component and is reflected as such.
- Purchase of a new street sweeper during the 2011-2012 reporting year was not represented in this analysis since the entire cost was funded by outside sources.
- Employee attendance at training events hosted internally is not incorporated as a stormwater expenditure, though cost to develop and conduct training is considered.

Tempe's stormwater expenditures reflect an increase over the 2010-2011 reporting year. The following considerations help to explain this increase.

- The 2011- 2012 reporting year represented the first full year of program implementation under the existing permit. The previous report accounted for roughly six months of implementation for some programs.
- A significant amount of time and resources were directed to several stormwater-related programs during the most recent reporting period. (i.e., monitoring, mapping, infrastructure inspections and cleaning, etc.)
- Stormwater-related BMP upgrades to municipal facilities have required the use of financial resources.

During the 2011-2012 reporting year, one stormwater-related budget was specifically increased. This component was related to the allocation of funds dedicated to Tempe municipal facility BMP

upgrades. While expenditures in various other budgets did reflect stormwater-specific increases, actual budgets for these programs did not necessarily change.

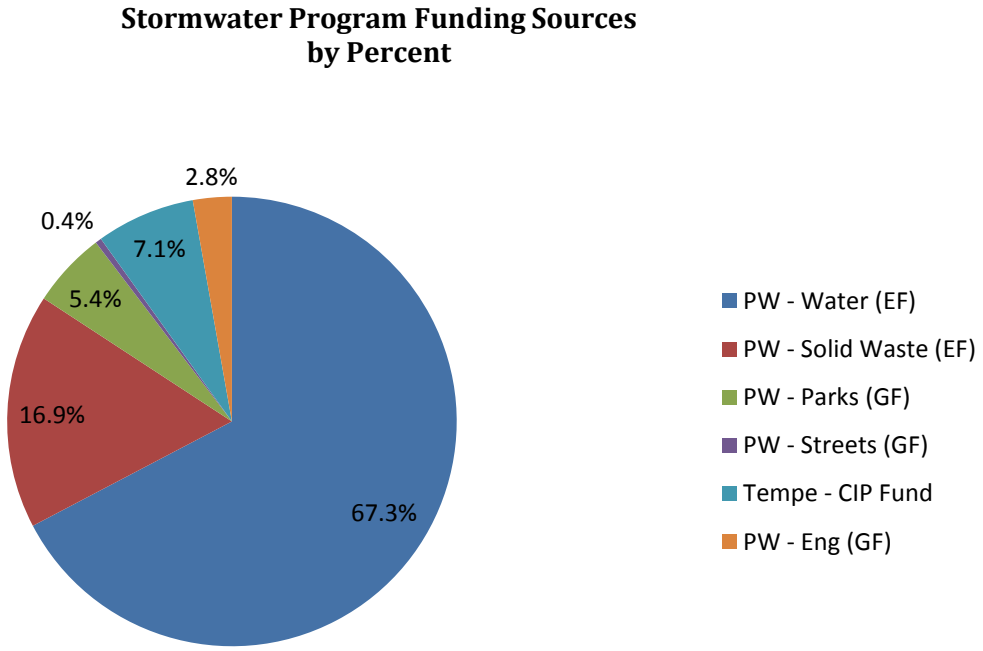
Tempe cannot accurately estimate the scope of budget changes and cost allocations for the 2012-2013 reporting year; however, the City does anticipate expenditures similar to this year. Tempe will continue to streamline various City processes and increase operational efficiencies to ensure that all stormwater regulatory mandates are met in an economically and environmentally responsible manner. A full summary of this Fiscal Analysis can be found in Table 16.

Table 16: Tempe MS4 Annual Expenditures and Fiscal Analysis Fiscal Year 2011/2012

Activity	Amount in U.S. Dollars	Funding Source(s)	Notes
Program administration (annual reporting, SWMP development, implementation, training, etc.)	$282,864	PW - Water (EF)	Cost allocation charge for 1.75 EQS/EPS
Legal Counsel	$2,716	PW - Water (EF)	Legal counsel - time
Municipal Facility Stormwater Upgrades and Infrastructure Repair	$21,401	PW - Water (EF)	Cost for facility BMPs and minor infrastructure repair
Public Education and Outreach		PW - Water (EF)	
Materials	$1,055		Handouts and BMP brochure printing
Memberships (i.e., STORM)	$2,500		STORM Membership
Other	$250		Event Fee
Public Involvement and Participation			
Hazardous Mat Safety/HPCC	$256,715	PW - Solid Waste (EF)	1/2 Full Operational Expenditures
"Adopt-A-" and Volunteer Prgms	$80,000	PW - Parks (GF)	Supplies-Equipment-Time
Adopt-A-Street	$1,400	PW - Streets (GF)	Time
Training (external)	$783	PW - Water (EF)	External Stormwater Training
Capital expenses for new, replaced, or repaired stormwater sewers, capital for facility replacement.	$108,055	Tempe - CIP Fund	Repair/Replace storm sewer
Operational expenses for cleaning and/or repairing stormwater sewers.		PW - Water (EF)	
Cleaning (internal)	$1,699		Internal cleaning labor
Cleaning (contract)	$67,042		Contract cleaning
Engineering Capital Construction Stormwater Program	$33,305	PW - Eng (GF)	Staff Time
Engineering Private Construction Stormwater Programs	$9,085	PW - Eng (GF)	Staff Time

Stormwater GIS development, maintenance, and operations, staff time, etc.	$73,200	PW - Water (EF)	Stormwater GIS development, maintenance, operations, and staff time
Inspections/enforcement (outfalls, IDDE, industrial/commercial, etc.) and sampling assistance.	$111,435	PW - Water (EF)	Inspections - time and equipment
Monitoring/Analytical		PW - Water (EF)	
Analytical	$3,800		External Lab Fees Only
Staff Time - Sampling	$89,357		Staff sampling and in-house analytical
Staff Time - Chemists	$65,000		
Equipment	$27,669		Sampling Equipment
CCTV	$12,800	PW - Water (EF)	Inspection - time and equipment
Parks	$2,567	PW - Parks (GF)	Inspection - time and equipment
Streets			
Inspections	$5,309	PW - Streets (GF)	Time
Street sweeping	$258,722	PW - Water (EF)	4 FTEs - Stormwater Expenditures
Total	**$1,518,729**		

A summary of funding sources can be found below.



13. Attachments

In an effort to save resources and paper, Tempe is providing all attachments in electronic format. In the event ADEQ feels that there is missing information or would like paper copies of any attachment, please feel free to contact Tempe's stormwater representative. Table 17 summarizes the attachments.

Table 17: Summary of Report Attachments

Attachment Letter Designation	Attachment Name	Attachment Letter Designation	Attachment Name
A	OUTREACH, EDUCATION, AWARENESS	O	MSGP-SARA INVENTORY
B	STORM ANNUAL REPORT	P	INDUSTRIAL COMMERCIAL INSPECTIONS
C	TRAINING SIGN IN SHEETS	Q	RESTAURANT INSPECTIONS
D	ESS ARCA AND OTHER INFRASTRUCTURE INSPECTIONS	R	NON-FILER NOTIFICATIONS
E	MS4 CLEANING EVENTS AND EXPENSES	S	CONSTRUCTION INSPECTIONS
F	PARKS AND OPEN SPACE INFRASTRUCTURE INSPECTIONS	T	TEMPE CITY CODE
G	STREETS INFRASTRUCTURE INSPECTIONS	U	OUTFALL INSPECTIONS
H	WUD ENG CCTV REPORTS	V	STORMWATER CONTROL MEASURE FIELD MANUAL
I	CALL-OUT SUMMARY	W	SAMPLING EVENT PARAMATERS
J	ENFORCEMENT DOCUMENTS	X	MS4 SAMPLE EVENT TRACKING
K	MUNICIPAL FACILITY INSPECTIONS	Y	SUMMARY OF MONITORING DATA
L	MUNICIPAL FACILITY CHEMICAL HANDLING AND SPILL PROCEDURES	Z	LABORATORY REPORTS
M	HWMP	AA	SWQS COMPARISON
N	COT MS4 PESTICIDE HERBICIDE PLAN	BB	POLLUNTANT LOADING REPORT