MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) COMPLIANCE AUDIT

REPORT DATE: October 24, 2008
EVALUATION CONDUCTED: August 25-27, 2008

CITY OF MESA, ARIZONA

U.S. Environmental Protection Agency Region 9
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EXECUTIVE SUMMARY

Deficiencies identified include:

- The City is not adequately implementing and maintaining structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites.

- The City has not conducted an evaluation to determine which industrial facilities and other non-industrial sources or categories may discharge significant quantities of pollutants. (Section I.B.2 and B.3 of Permit)

- The City lacks an adequate assessment of program effectiveness in the annual report. (Section I.C.2 of Permit)

Several recommendations include:

- The City should educate municipal personnel and field staff so that they can identify and report conditions that may indicate illicit discharges into the MS4.

- The City should assess municipal maintenance activities performed by the City (e.g., paving and road repairs, saw cutting, concrete work, curb and gutter replacement, buried utility repairs and installation, vegetation removal, street and parking lot striping, drainage channel cleaning, etc.) and develop BMPs for those activities. The City could develop a BMP field manual for municipal maintenance activities.

- The City should develop an Enforcement Response Plan (ERP) .

INTRODUCTION

On August 25-27, 2008, PG Environmental, LLC with assistance from EPA Region 9 and attendance of the Arizona Department of Environmental Quality (ADEQ) conducted an audit of the City of Mesa's (hereafter, City) Municipal Separate Storm Sewer System (MS4) program. Discharges from the City's MS4 are regulated by EPA issued National Pollutant Discharge Elimination System (NPDES) MS4 permit number AZS000004 (hereafter, the permit), effective March 19, 1997, and modified May 23, 1998. The permit has been administratively continued and the City is awaiting permit reissuance by ADEQ. The purpose of the audit was to determine the City's compliance with requirements of the permit and evaluate the current implementation status of the permittees' stormwater management programs. Additional goals were to review the overall effectiveness of each program, identify and document positive elements of each program that could benefit other Phase I programs, and acquire data to assist in reissuance of the permit.

The audit focused specifically on the following program areas: (1) Drainage System Maintenance; (2) Controls for New Development and Significant Redevelopment; (3) Maintenance of Public Streets, Roads, and Highways; (4) Flood Management Projects; (5) Controls for Municipal Waste Facilities; (6) Controls for Pesticides, Herbicides, and Fertilizers; (7) Industrial Facilities; (8) Construction Sites; and (9) Storm Water Monitoring Program. The

EPA Audit Team did not evaluate or assess compliance with the Illicit Connections and Illegal Dumping (ICID) section of the permit. ICID was briefly discussed as part of other program elements during the course of the audit, but was not specifically evaluated. The audit was not intended to be a comprehensive evaluation of all components and requirements associated with the entire MS4 program. The audit schedule and primary attendees is contained in Appendix A.

The City of Mesa is a suburb of Phoenix that encompasses more than 130 square miles in the southeast portion of Arizona. It is the third-largest city in Arizona with a total population of approximately 460,155 according to the 2006 U.S. Census estimate. The City's MS4 permit authorizes the City to discharge storm water runoff from its MS4 to waters of the United States in accordance with the permit conditions. The City's Environmental Programs Division (hereafter, Environmental Programs) administers the implementation of the MS4 program. Several other City organizational divisions have responsibilities related to the MS4 program including: Building Safety Division (hereafter, BSD); Planning Division and GIS staff; Fire Department and its HAZMAT team; Parks, Recreation and Commercial Facilities Department (hereafter, Parks Department); Transportation Field Operations (hereafter, Transportation Operations); Solid Waste Management; and Engineering.

The EPA audit team evaluated compliance through a series of interviews, site visits, field evaluations, and document review.

The presentation of this report does not constitute a formal finding of violation. For clarity, items requiring the City's response are shown in **bold** while recommendations are presented in *italics*.

Drainage System Maintenance

On the basis of office discussions, a limited records review, and field verification of retention basin maintenance, the City appeared to be adequately implementing the drainage system maintenance provisions of the permit.

Controls for New Development and Significant Redevelopment

The City has adopted drainage and retention standards that require new and significant redevelopment to provide storm water retention for events up to and including the 100-year 2-hour duration storm. The City uses a relaxed standard in the downtown redevelopment area. The City's retention requirements have been in effect since December 1990, prior to the issuance of the NPDES permit. No changes have been made to the requirements based on the issuance of the NPDES permit to incorporate water quality elements.

Maintenance of Public Streets, Roads, and Highways

Two recommendations are provided below to improve the Road Maintenance program area.

The City has developed Storm Water Pollution Prevention Plans (SWPPPs) for its fixed facilities (e.g., corporate yards), however, it has not developed written standard operating procedures or practices for pollution prevention during road maintenance activities. City Transportation Operations staff explained that they are currently in the process of revising their standard operating procedures (SOPs). *It is recommended that the City incorporate best management practices (BMPs) for road maintenance activities into its SOPs. The City should also assess all municipal maintenance activities performed by the City (e.g., paving and road repairs, saw cutting, concrete work, curb and gutter replacement, buried utility repairs and installation, vegetation removal, street and parking lot striping, drainage channel cleaning, etc.) and develop BMPs for those activities. The City could also develop a BMP field manual for municipal maintenance activities.* The City is referred to the following website which provides an example of municipal maintenance activity BMPs: http://www.cabmphandbooks.com/Municipal.asp. Successful implementation of storm water pollution prevention practices relies on direct, hands-on collaboration with facility staff to instill ownership of the pollution prevention documents and ensure their full deployment. The City has taken this approach in developing SWPPPs for its corporate yards and should maintain this approach with any additional SOPs or BMP documents that it chooses to develop.

During the course of the audit activities, the Audit Team observed a transportation staff member conducting street sweeping operations. Questioning indicated that field staff do not fully understand how their job duties may impact discharges from the MS4. For example, the City transportation staff member did not appear knowledgeable of the importance of avoiding over-application of sweeper water and non-storm water discharges. Additionally, staff did not appear to know how to respond in the event they see an illicit discharge. Although the transportation staff member displayed a functional understanding of who should be contacted in the event that a illicit discharge is observed, the staff member was unaware of the City's Environmental Programs Hotline number. City Environmental Programs personnel described their ongoing efforts to educate municipal staff and believed that their environmental awareness training curriculum could easily be modified to address this issue. *It is recommended that the City educate municipal personnel and field staff so that they can identify and report conditions that may indicate illicit discharges into the MS4. This would allow the City to use its field staff to detect and eliminate illicit discharges. Furthermore, the number of complaints made by City employees should be tracked in the City's existing environmental complaint database system as one measure of program effectiveness.*

Flood Management Projects

The City has implemented a system to cooperate with the Maricopa County Flood Control District (hereafter, Flood Control District), who owns and operates the primary flood control structures in the City's jurisdiction. Specifically, the City takes part in design review for proposed Flood Control District projects located in the City relating to flood management projects.

Controls for Municipal Waste Facilities

Environmental Programs staff explained that the City does not own or operate any municipal waste treatment, storage, or disposal facilities. Based on an office discussion, the provisions of the permit relating to municipal waste facilities may not apply.

Controls for Pesticides, Herbicides, and Fertilizers

The City operates a household hazardous waste (HHW) temporary storage area located at the East Mesa Service Center.

Industrial Facilities

<note: A full evaluation of the Industrial/Commercial programs for all the Phoenix area MS4 permittees is provided in a separate report>

A. Industrial and Commercial Source Inventory

The City maintains its industrial source inventory in several ways. Mesa collects Notice of Intent (NOI) information for dischargers within its jurisdiction. Under City ordinance, an entity discharging into the MS4 who is required to submit an NOI in association with any federal or state storm water requirements must also submit a copy of the NOI to the City. The City then assesses the NOI information and determines whether the industrial activity or facility must be added to its source inventory. Mesa also conducts annual reviews of the EPA TRI database to identify facilities that are subject to SARA Title III. Additional facilities are added from lists of facilities with hazardous substances, which the Maricopa County Local Emergency Planning Committee maintains. The resulting source inventory consists of 35 facilities that are subject to SARA Title III and 2 facilities that were added as a result of a formal complaint.

The permit states that the source inventory "shall also include other industrial facilities, and non-industrial sources or categories of sources which the permittee believes may discharge significant quantities of pollutants in storm water runoff." The City has not included other industrial facilities (e.g., those which are not subject to SARA Title III) and nonindustrial facilities (e.g., commercial businesses such as restaurants and automobile repair shops) in its source inventory. Without including the commercial land use component and an expanded industrial inventory, the City may not be addressing all significant pollutant sources. The City's program to address other industrial and nonindustrial facilities is reactive in the sense that such facilities are assessed only in response to a formal complaint made to the City's environmental complaint hotline. The City maintains a complaints database to track resolution of complaints, but has not analyzed its data to identify trends and assist in prioritization of sources, or for targeting of specific jurisdictional areas. Although no effort was made to verify the validity of complaints, a cursory review of the City's complaints database suggests that commercial businesses may be a significant pollutant source within the community. City personnel explained that the source inventory has not been expanded because of apprehension about committing to do proactive inspections of additional facility types. **The City must assess the potential pollutant**

sources in its jurisdiction, including municipal, industrial, and commercial facilities, for inclusion of additional facility types in its source inventory and the inspection process.

B. Method of Regulating Industrial and Commercial Sources

Mesa has developed an inspection program as a tool for regulating the facilities included in its source inventory. According to the City's Industrial Facility Inspection Standard Operating Procedures dated August 2008 (hereafter, Mesa Industrial Inspection SOP), Section 3.7, the City conducts inspections of industrial facilities only to ensure compliance with the City code. The City limits its review of industrial facility SWPPPs; the plan review is used to familiarize the inspector with the facility's operations and as a mechanism for providing compliance assistance support to the facility operator. According to the annual report, the City only conducted 8 industrial stormwater inspections last year. It should be noted that Mesa's process contrasts sharply with the approach used by the City of Tempe. Tempe's approach leverages the MSGP requirements with the view that its MS4 program can benefit from facilities having MSGP coverage, industrial pollution prevention controls, and state and federal regulatory oversight.

In its annual report, the City lists the number of inspections conducted as a performance measure but the City has not identified measurable goals for the industrial/commercial program nor has it evaluated the effectiveness of the program. **The annual report does not provide information on the results and outcomes of inspections (other than the number of inspections conducted).**

C. Enforcement Escalation Mechanisms and Their Use

Mesa has developed a "Storm Water Pollution Control" ordinance, which grants the City broad authority to regulate both the actual discharge and the potential to discharge pollutants to the City MS4. In addition, this ordinance empowers the City to require all practicable best management practices identified by the City Engineer, including requirements imposed by applicable NPDES Storm Water Permits. However, the City Engineer has not designated or formally adopted a set of minimum BMPs (i.e., an industrial and commercial BMP manual). Furthermore, the Mesa Industrial Inspection SOP, Section 4.2, states that the "City only uses this [enforcement] authority [under the Storm Water Pollution Control ordinance] when all other options have failed....The City prefers to operate under a voluntary compliance program." **Although this approach might have been functional to date, situations in which this cooperative tactic would not adequately ensure compliance with the City's MS4 permit could arise.**

D. Conclusions for the City of Mesa

The information gathered during the evaluation indicates that the Mesa Industrial and Commercial Facilities program element appeared functional, but improvements are needed to support adequate advancement of the program. Specifically, the City could improve the scope of its inspections, its enforcement policy, and its assessment of potential pollutant sources within its jurisdiction. **The City has not evaluated the contribution of other commercial/industrial**

pollutant sources in its inventory. The City has not identified measurable goals for the industrial/commercial program nor has it evaluated the effectiveness of the program. The annual report does not provide information on the results and outcomes of inspections (other than the number of inspections conducted).

Construction Sites

Positive elements of the City's construction program include the requirement that the City obtain a copy of the NOI prior to issuing a building permit. Also, the City has developed a standardized construction checklist with standardized problem comments to streamline inspections. Additionally, the City requires City contractors to co-sign NOIs for public construction projections to ensure contractor responsibility for BMPs on site.

The City has established a goal to inspect all construction sites once during the life of construction. **One inspection during the life of construction is not sufficient to ensure compliance with city code, as evidenced in the site visits performed by the audit team** (see below). *It is recommended that the City establish a prioritization for inspections of constructions sites, which establish a higher frequency of inspections for those facilities that have the potential to significantly contribute to the storm drain (eg., large sites, hillside development, sites located close to surface waters, sites with past compliance issues, etc.).*

The Audit Team performed site visits at two public works projects and two private construction sites. Observations pertaining to the majority of these sites are presented below in a series of individual construction site assessments. Following the individual assessments, conclusions are presented which directly pertain to the City's oversight obligations under its MS4 permit.

Private Site: Mountain View Village Center located at the southeast corner of E. Baseline Rd. and S. Signal Butte Rd. in Mesa, AZ

During the audit, adequate BMPs were not implemented to prevent the discharge of sediment from a large expanse of disturbed area. A drainage channel conveys flow into the northeast side of the site (see attached Photograph 1), where silt fence had been improperly installed in an area of concentrated flow. The drainage channel leads west across the site and earthen check berms had been installed along this course (see attached Photograph 2). The earthen check berms utilized in the drainage channel were not properly selected or installed in accordance with specifications and design criteria meeting good engineering practice requirements as they were not compacted and did not have a defined weir section. Earthen check berms consisting of unconsolidated fill do not constitute an appropriate flow dissipation device, particularly when placed within a drainage channel. Consequently, the earthen check berms had been compromised by a recent flow event (see attached Photographs 3 and 4). There were no temporary erosion and sediment control BMPs installed between the large expanse of disturbed area and the flowing drainage channel (see attached Photographs 2, 3, 4 and 5). Moreover, the only BMPs observed at the site were those installed in the drainage channel itself. Down-gradient of the series of check berms, for example, silt fence was installed within the

concentrated flow of the drainage channel prior to it exiting the site (see attached Photograph 6) and flowing under S. Signal Butte Road. The drainage channel daylights on the west side of S. Signal Butte Road, immediately adjacent to the site. Sediment, debris, and turbid flow were observed in the drainage channel above and below an offsite flow control structure (see attached Photographs 7, 8, 9 and 10). As a result, there was a discharge of sediment to the drainage channel which leads southwest in the direction of the East Maricopa Floodway. The area shown in Photographs 7 and 8 is directly downstream of the failed silt fence shown in Photograph 6, depicting a clear contribution of sediment to the offsite discharge. A City Environmental Programs representative stated that this situation would qualify as a violation of City ordinance, however, the City did utilize enforcement authority and it does it appear that the City would pursue any follow-up related to enforcement.

(see Finding 2 below). **The City must require the implementation of adequate nonstructural and structural BMPs to prevent the discharge of sediment from the large expanse of exposed soil located throughout the Mountain View Village Center project site.**

Private Site: Superstition Springs Commerce Center located at 7235 E. Hampton Avenue in Mesa, AZ

The site is located immediately adjacent to a drainage that was referred to during the audit as the Arizona Department of Transportation (ADOT) Channel (see attached Photograph 11). Adequate BMPs were not implemented to prevent the discharge of sediment and other pollutants from the construction site area. Inspectors did not observe any erosion and sediment control BMPs during review of the site. Specifically, BMPs were not observed between the disturbed area and the ADOT Channel (see attached Photograph 11); or as perimeter control along Hampton Avenue (see attached Photograph 12). Furthermore, the only BMPs observed at the site were those installed for concrete washout. Concrete waste was observed outside the containers and one of the two containers was nearing capacity, potentially due to a recent precipitation event (see attached Photograph 13). As a result, there was a potential for disturbed soils and concrete waste to contribute pollutants to storm water runoff, and also for the subsequent discharge of pollutants offsite. **The City must require the implementation of adequate nonstructural and structural BMPs to prevent the discharge of pollutants from the Superstition Springs Commerce Center construction site.**

Public Site: Mesa Municipal Court located at 250 E. 1st Avenue in Mesa, AZ

Silt fence and straw wattles had been installed as perimeter control BMPs for the Mesa Municipal Court construction site, a relatively flat infill construction site. However, several BMPs were not selected, installed, or maintained in accordance with specifications and design criteria meeting good engineering practice requirements. Specifically, the straw wattles utilized along the southern perimeter of site were installed on an impervious surface and therefore were not properly entrenched or anchored to create an adequate seal (see attached Photograph 15). In addition, sections of the silt fence along the southern perimeter were not maintained with adequate entrenchment (see attached Photograph 16). Furthermore, evidence of previous uncontrolled concrete disposal and concrete washing activity was observed; including concrete waste at various locations in the western portion of the site (see attached Photographs 17, 18, and

19). As a result, there was a potential for disturbed soils and concrete waste to contribute pollutants to storm water runoff, and also for the subsequent discharge of pollutants offsite. **The City must require the implementation of adequate nonstructural and structural BMPs to prevent the discharge of pollutants from the Mesa Municipal Court construction site.**

Finding 1. Failure to Adequately Develop Requirements for Nonstructural and Structural BMPs

The City's Part II Permit Application dated May 17, 1993 (hereafter Part II Application), Table 4.4, description of BMP requirements, states that the City has worked with the Flood Control District to develop a manual titled "Best Management Practices and Erosion Control Manual for Maricopa County Arizona" (hereafter, the Flood Control District Erosion Control Manual) which lists numerous BMPs used on construction sites (see attached Exhibit 2). However, according to an Environmental Programs representative, the City does not formally require the use of the Flood Control District Erosion Control Manual.

The City of Mesa Code, Chapter 5 (hereafter, City storm water ordinance), includes Sections 8-5-3 (A) and (D) which pertain to the regulation of construction activities. A review of the City's storm water ordinance demonstrated that it grants the City broad authority to regulate both actual and potential discharges of pollutants into the MS4. In addition, Section 8-5-3 (A) of the ordinance enables the City to require "all practicable best management practices identified by the City Engineer", including requirements imposed by applicable NPDES Storm Water Permits (see attached Exhibits 3a and 3b). However, the City Engineer has not designated or formally adopted a set of minimum BMPs (i.e., a Construction BMP Manual). **As a result, the City is not holding the development community accountable for the selection, installation, or maintenance of BMPs in accordance with proven specifications and design criteria meeting good engineering practice requirements.** For example, BMPs were not adequately installed and maintained to prevent the discharge of pollutants from the Mountain View Village Center, Superstition Springs Commerce Center, and Mesa Municipal Court construction sites. This may be attributed to the lack of a over-arching set of minimum BMPs and subsequent implementation. Formal adoption of such minimum BMP standards (e.g., Flood Control District Erosion Control Manual, self-developed standards, or otherwise) would provide enforceable standards to City staff as they conduct inspections. This would also alleviate the burden of providing compliance assistance in an ad-hoc manner. Ultimately, adoption of minimum BMP standards will help to deliver a clear message to the development community on the City's expectations for BMP implementation. **The City must develop a comprehensive program to "implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites," which shall include "requirements for non-structural and structural best management practices" in accordance with 40 CFR §122.26(d)(2)(iv)(D) (what about the permit?).** *Moreover, it is strongly recommended that the City utilize the broad authority granted under its storm water ordinance to formally designate a set of minimum BMPs and ensure their implementation at each construction site within its jurisdiction.*

Finding 2. Failure to Adequately Develop Procedures to Enforce Legal Authority over Construction Activities

40 CFR §122.26(d)(2)(iv)(D) requires the City to develop a comprehensive program to "implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites," which shall include "procedures for identifying priorities for inspecting sites and enforcing control measures." Pursuant to 40 CFR §122.26(d)(2)(iv)(D), the City has developed a Construction Site Standard Operating Procedures Manual dated August 2008 (hereafter, City Construction Site SOP). Although the City has been granted broad authority under its storm water ordinance (see above), the City Construction Site SOP, Section 6.2.1, states that the "City only uses this [enforcement] authority when all other options have failed...The City prefers to operate under a voluntary compliance program" (see attached Exhibit 4a and 4b). Correspondingly, the City's Storm Water Annual Report for the 2006–2007 Permit Year (hereafter, City Annual Report 2006–2007), page F-1, states that "during the 2006/2007 reporting year no formal enforcement actions were taken by the City. Environmental Programs was able to work cooperatively with responsible parties to remedy identified pollutant source problems" (see attached Exhibit 5). Construction site conditions observed during the audit suggest that the City's cooperative methods are not adequately ensuring compliance with the City's MS4 permit .

Specifically, it was observed during the audit that BMPs were not adequately implemented for all potential pollutant sources at both private and public construction sites. At the Mountain View Village Center, for example, there were no temporary erosion and sediment control BMPs installed between a large expanse of disturbed construction site area and a flowing drainage channel, and there was a resulting offsite discharge of sediment to the drainage channel which leads southwest in the direction of the East Maricopa Floodway. A City Environmental Programs representative stated that this would qualify as a violation of City ordinance but the City does not exercise its enforcement authority. At the Superstition Springs Commerce Center, the only BMPs observed at the site were those installed for concrete washout. At the Mesa Municipal Court, perimeter control BMPs had been installed, but the concrete waste pollutant source was left uncontrolled. The City exhibited a lack of adequate public and private construction oversight to prevent the discharge of pollutants from these locations. **The City must develop a comprehensive program to "implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites," which shall include adequate "procedures for identifying priorities for inspecting sites and enforcing control measures" in accordance with 40 CFR §122.26(d)(2)(iv)(D).** *Moreover, it is strongly recommended that the City correct these site conditions through prompt and effective enforcement of its storm water ordinance as necessary to comply with its MS4 permit, and fully test its enforcement mechanisms to ensure adequate legal authority and processes are in place in the event they are truly needed. Because formal enforcement procedures are not clearly articulated in the City's storm water ordinance, the City would benefit from the development of an Enforcement Response Plan (ERP).*

Program Effectiveness

The City has not conducted an assessment of the program's effectiveness. Section I.C.2 of the permit requires "an assessment of the effectiveness of the best management practices

described in the SWMP and monitoring program including a summary of enforcement actions, inspections, and public education programs; a summary of the data, including monitoring data that is accumulated throughout the reporting year, and an assessment of water quality improvement or degradation."

While the annual report includes basic information on the activities conducted, it does not adequately evaluate the effectiveness for many of the program elements. For example, the 05/06 annual report lists the number of industrial and construction inspections conducted, but does not provide information on the results or outcomes of those inspections. The City does not appear to be making adjustments to the program based on an assessment of the needs and effectiveness of existing BMPs. The City should consider establishing programmatic goals and methods of assessing improvements to the water quality from the storm drain system. For example, as mentioned earlier, the number of complaints made by City employees could be tracked in the City's existing environmental complaint database system as a measure of program effectiveness A useful document on "MS4 Program Effectiveness assessment Guidance Document" is available at http://www.CASQA.org.