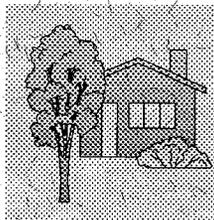
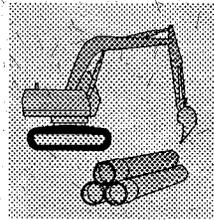


NPDES PERMIT APPLICATION FOR DISCHARGES FROM MUNICIPAL SEPARATE STORM SEWER SYSTEM

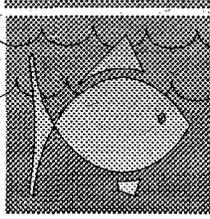
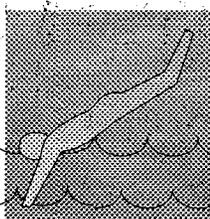
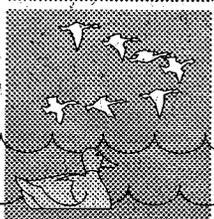
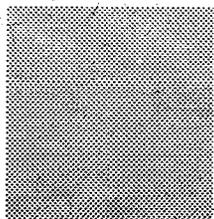
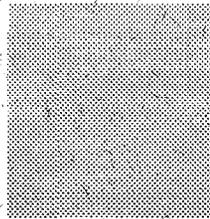
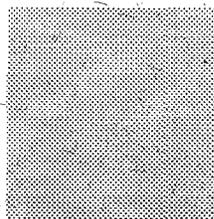
PART 2

for

**CITY OF TEMPE
MARICOPA COUNTY
STATE OF ARIZONA**



MAY 14, 1993



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**NPDES PERMIT APPLICATION FOR DISCHARGES FROM
MUNICIPAL SEPARATE STORM SEWER SYSTEM**

for

**CITY OF TEMPE
MARICOPA COUNTY
STATE OF ARIZONA**

PART 2

MAY 14, 1993

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INTRODUCTION

This Part 2 Permit Application by the City of Tempe, Arizona, has been prepared in accordance with 40 CFR 122.26 as published in the Federal Register/Vol. 55, No. 222/Friday, November 16, 1990. EPA Document 833-B-92-002, November 1992 Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems was used for guidance.

The Permit Application is organized in a textual narrative document accompanied by appendices referenced to the specific subjects addressed in the narrative. The Appendix is paginated to maintain order as it is referenced from the text. The ring binders contain the Appendix.

OVERVIEW

On May 14, 1992, the City of Tempe submitted the Part 1 of the NPDES MS4 Permit Application containing information about the existing storm drain system and programs for storm water pollution control. The approval of the Part 1 Application by EPA was received by the City on August 19, 1992. EPA Region IX had some concerns about certain portions of the information in the Part 1 Application. These points of concern will be enumerated in the appropriate sections of this Part 2 Application document.

This Part 2 Application is being submitted to EPA on May 14, 1993, in accordance with the regulations and contains among other requirements of the Final Rule, the outline of the proposed "comprehensive storm water management program". This application will serve as a basis of negotiation with EPA Region IX on the terms of the NPDES permit for discharges from the municipal storm drainage system over the next five years. The City believes that the proposed management program will control storm water pollution to the "maximum extent practicable" over the term of the permit.

All new facets of the storm water management program, additional staff, costs or ordinances, are subject to approval by the Mayor and City Council of the City of Tempe. Approval will be sought following EPA's review and comment on this application. New parts of the storm water management program will be presented to Mayor and Council as a part of the annual budget process. Therefore, the proposed management plan can only be implemented to the extent that funds are available, and approval forthcoming each year.

This Part 2 Application will reference and build on information submitted in the Part 1 Application. The emphasis for the storm water management program will revolve around the City of Tempe's onsite storm water retention policy. The onsite storm water retention ordinance was revised by the City Council in February 1993. The request for personnel and equipment to begin a storm drain maintenance program within the Public Works Department has been submitted for approval with the current budget. A supplemental budget request to reinstitute a household hazardous waste collection program has also been made. Storm water sampling of the outfalls delineated and approved in the Part 1 Application will begin and continue throughout the permit term. A critical look at the industrial potential for pollution of storm water will be made by organizing an inventory of industrial activity by watershed and integrating this information with various GIS databases. In addition to existing programs that reduce pollution potential, pilot programs and "phased implemented" programs are presented in the storm water quality management program.

PART 2 - SIGNATORY/CERTIFICATION

Individual Application

Name of Applicant: City of Tempe, Arizona

Principal Exec. Officer Terry Zerkle, City Manager

"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 gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."


Terry Zerkle
City Manager

Date: May 14, 1993

Contact Person: Lee M. Quaas, City Engineer/City of Tempe

Address: 31 E. 5th Street, Tempe, AZ 85281

Phone Number: (602) 350-8200

ADEQUATE LEGAL AUTHORITY

The City of Tempe has submitted an extensive explanation of the existing legal authority to satisfy Section § 122.26(d)(2)(i) with the Part 1 Application. EPA Region IX indicated that we had satisfactorily demonstrated that current legal authority under existing federal, state and city codes is adequate.

We have strengthened the implementation of our Best Management Practice (BMP) of onsite storm water retention with the passage of Ordinance No. 93.03 in February 1993. This new ordinance clarifies that all required retention must accommodate the 100 year one-hour storm run-off. It also requires all grading work to be in compliance with federal regulations.

On the recommendation that a more comprehensive storm water quality ordinance should be adopted, the City of Tempe is submitting a draft ordinance to implement a "storm water quality management program". This ordinance should clarify the aspects of storm water quality as applied by the federal statute at the local level. The ordinance is to control not only discharges to Waters of the U.S. but to allow regulation of the quality of storm water in onsite storm water retention areas. Equal enforcement of storm water quality for both public and private storm water management systems is the intent.

Ordinance No. 93.03 is in the Appendix P.P. APP-1. The storm water quality management program draft ordinance is also included in the Appendix P.P. APP-2. EPA's comments will be considered for its finalization and adoption. Tempe anticipates City Council action within the first year of the permit term.

SOURCE IDENTIFICATION

Region IX EPA stated in its letter of August 19, 1992, that insufficient discussion of the "historic use of ordinances to limit discharges of non-storm water into POTW's" was submitted in the Source Identification section of the Part 1 Application. The section on Legal Authority in the Part 1 Application did include a limited discussion of Chapter 27 of the Tempe City Code: Sewers and Sewage Disposal. The references to the Tempe City Code cited in the Legal Authority Section were included in Appendix A. We draw your attention to Section 27-61 (Discharge of Certain Wastes Prohibited), Section 27-62 (Waste Subject to Approval; Pretreatment Interceptors), Section 27-63 (Septic Tank and Scavenger Waste Haulers), Section 27-64 (Prohibited Substances). It should be noted that the local limits on the 91st Avenue (City of Phoenix) POTW are being changed and the specific substances covered under this particular Section (27-64) will be modified in the future (this will be documented in the annual report(s)). Article V-Industrial Users and Discharge, Section 27-76 (Definitions), Section 27-77 (Enforcement; Penalties), Section 27-78 (Sewer Charge, Section 27-79 (General Requirements), Section 27-80 (Specific Requirements), Section 27-81 (Confidentiality of Information), Section 27-82 (Stricter Provisions to Prevail), Section 27-83 (Accidental Discharges), Section 27-84 (Pretreatment Requirements), Section 27-85 (Penalties and Remedies). Tempe believes a review of this material should satisfy the Part 1 requirement.

The response to the Part 1 Application also raised questions relating to the canals within Tempe owned and operated by the Salt River Valley Water Users Association. EPA considers these canals to be Waters of the U.S. and therefore any major outfalls of storm drainage into these should be documented. As was pointed out in the Part 1 Application, the canals themselves are delivery systems and do not act as discharge points for any of Tempe's MS4 major storm water outfalls. The photographs of the Western Canal on the east side of Rural Road in South Tempe show that the canals are elevated above land surface elevation (See Appendix P.P. APP-3 to APP-5). Irrigation tail water flows are piped to natural and manmade outfalls, not delivery canals, within the City of Tempe.

The application for Part 1 referenced a map of the macro drainage areas which was not complete at the time of submittal. Since the Part 1 Application submittal, additional manhours have been applied to the GIS database to produce a more comprehensive watershed/outfall delineation. Outfalls to other storm drain systems (ADOT, Phoenix, Maricopa County Flood Control District) and structural controls without outlets (major retention basins) have been identified. See table in Appendix P.P. APP-6. In addition, these watersheds (macro drainage areas) have been identified more thoroughly on the Roll Map.

Inventory of Industrial Dischargers Organized by Watershed

The industrial inventory by watershed is a large, complex database that will be formed utilizing information from several diverse sources. Tempe has completed a database in the Tempe Geographic Information System (TGIS) which identifies each industrially developed property and the watershed the property falls within. These watersheds correspond to a point source outfall to a Water of the United States and are accordingly identified.

The City of Tempe has developed an initial Priority Industrial Facilities and Watershed Inventory to be used in our on-going program to assure desirable water quality from the MS4. See Appendix P.P. APP-7 . This initial inventory is comprised of facilities which have submitted a Notice of Intent to EPA for coverage under the NPDES general permit. It will be compared to the TGIS land use inventory database and be used to isolate potential sources of significant pollutants which may be found in our monitoring program.

Questionnaires are being sent to each industrial facility to inventory used or stored petroleum, oil, non-biodegradable cutting oil, mineral oil products, pesticides, organic chemicals, paints, plating wastes, radioactive substances, solvents, liquid waste or sludges on the premises. The inventory also identifies any existing spill prevention plans (See Appendix P.P. APP-8). This effort will include facilities that are regulated under the wastewater pretreatment program having the potential for storm water pollution. Over the course of the next two years, the results of these questionnaires will be used to expand the TGIS general industrial land use sites into the Priority Industrial Facility inventory.

The Priority Industrial Facility inventory will be inclusive of all TSD facilities subject to RCRA Subtitle C, and all other facilities meeting the criteria of the 11 categories included in the NPDES program. To date, the only permitted TSD facility in the City of Tempe is Digital Equipment located at 1901 West 14th Street within watershed TD-05 (the Tempe Drain 102 outfall). This information was requested in the Region IX EPA response letter of August 1992. See Map in Appendix P.P. APP-9.

Due to the limited resources currently available to conduct this process, the City of Tempe proposes to complete this inventory during the first year of the permit term.

CHARACTERIZATION DATA

Region IX EPA accepted the City of Tempe's characterization program submitted in Part 1 of the NPDES Permit Application. The five outfalls designated for permanent monitoring stations remain the same. The sampling equipment is identical to that specified in the previous document with the exception that the samplers will be housed in refrigerated enclosures to facilitate sampling for several parameters which are temperature sensitive. Currently, these stations are under construction. The construction schedule indicates completion and debugging of the equipment and systems by mid-May 1993. This should allow us to begin actual storm event sampling during the summer monsoon season. Sampling is to continue throughout the permit period to develop seasonal data and trends.

Currently, the only site where monitoring has taken place specifically following the requirements for NPDES storm water sampling is the industrial site known as TD03 (Tempe Drain Outfall No. 3 at 48th Street). This monitoring facility was installed by the Maricopa County Flood Control District (MCFCD) with the actual monitoring being conducted by the United States Geological Survey (USGS). Some preliminary data has been received from MCFCD for six sampled events from November of 1991 through August of 1992. Portions of this data are being used in estimating the annual pollutant loads for the entire City required under this section. For preliminary MCFCD-TD03 data see Appendix P.P. APP-10.

In the Part 1 Application grab sample data had been submitted from seven outfalls into the Salt River. These outfalls had designations of SR04, SR05, SR07, SR08, SR10, SR22 and SR23. These specific data sheets may be found in Appendix C of the Part 1 Application on Pages C-2 through C-8. Since the information presented in these tables was from grab samples taken early in the storm discharge period, a true event mean concentration from this data set is not attainable. It is, however, a local, site specific data set that can be utilized to provide annual loading prognostication. This data was used in combination with the provisional data received from the County Flood Control District for the industrial monitoring site to produce the total annual loadings for the required parameters.

The statute requires annual pollutant loads for total suspended solids (TSS), total dissolved solids (TDS), COD, BOD (five-day), nitrate plus nitrite nitrogen, total kjeldahl nitrogen (TKN), total phosphorous, dissolved phosphorous, cadmium, copper, lead and zinc. The data was statistically manipulated to arrive at an arithmetic mean (average concentration) of the samples. In cases where the actual sample concentration was less than the detection limit, one-half of the detection limit was utilized as a "hit" to arrive at a potentially statistically significant number. This has relevance only to the values for cadmium, copper and lead. If one disregards sample results less than the detection limit, there were only 3 out of 59 (5%) samples where cadmium was found. Using a similar analogy, copper was found in 28 of the 59 (47%) samples, and lead in 36 of the 59 (61%) samples. For computed "average concentration" data, see Appendix P.P. APP-11.

The run-off coefficients were determined by utilizing aerial photographs and measuring the impervious area on a per lot basis. Special run-off coefficients of .001 and .002 were assigned to lots where one hundred year and five year respectively onsite retention had been achieved. Utilizing these coefficients, a minor amount of land will statistically contribute to the total run-off volume. This is different than the "real world" wherein these parcels do not contribute any runoff to the outfalls. Using run-off coefficients so small, for every hundred acres of onsite retention land, it will appear statistically as if one acre is contributing run-off. We also will demonstrate the over all reduction in run-off volume to the Waters of the U.S. as a result of the widespread implementation of Onsite Storm Water Retention within the City of Tempe. See Table in Appendix P.P. APP-12 and Roll Maps.

The land was aggregated utilizing run-off coefficients times area, then multiplied by the annual rainfall (6.7") (from storm documentation submitted in the Part 1 Application) and the reduction coefficient of 0.9 from the guidance document for the Part 2 Application to produce a total annual volume of run-off. This value was then multiplied by the average concentration of the specific parameters to arrive at an annual pollutant loading in pounds. Actual event mean concentrations should be significantly less than the values obtained by grab sampling from early in the discharge curve. Calculation sheets are incorporated in the Appendix P.P. APP-13.

Without meaningful storm data, it is impossible for us to include valid event mean concentration values in this application. When the sampling stations are complete and sampling of actual storm events will begin, relevant event mean concentrations will be obtained. As storm data is gathered and mathematically reduced, these numbers will be included in the annual reports required during the permit term.

The intent of the initial storm water monitoring effort is to be able to understand the selected watersheds and the pollutant parameters that may be relevant. The City of Tempe Storm Water Quality Management Program will not initiate an immediate investigative/enforcement follow-up effort for one-time occurrences of pollutants. A statistically significant number of samples will be taken before any extended investigation into site specific sources will be initiated. The characterization will be conducted in phases, building, in each phase, on the information gathered in the preceding effort. This philosophy is based on several factors:

1. The limited resources of the City.
2. Storm water runoff flows, the majority of the time, into a dry ephemeral stream which is not used for drinking water, fishing or body contact recreation.
3. The uncertainty in this arid climate, characterized by infrequent thunderstorm events, and the nature and extent of storm water pollution do not warrant the creation of an extensive characterization effort at the outset of the program.

An exception to this phased approach will be the Kiwanis Park Lake. This lake, because of its use as a recreational area, will be subjected to more extensive, initial scrutiny.

Monitoring will be conducted by personnel in the Environmental Services Division (See organizational chart, Appendix P.P. APP-14) or by contractors, depending on the resources of the City at any given time.

PROPOSED MANAGEMENT PROGRAM*

6.3 Programs to Control Storm Water Runoff from Commercial and Residential Areas, Construction Sites and Industrial Facilities

6.3.1 Commercial and Residential Activities

6.3.1.1 New Development and Significant Redevelopment

Tempe will continue to utilize onsite storm water retention for new development and significant redevelopment as was outlined in the Part I Application. To date, this has reduced total runoff volume by ___%. We anticipate similar reductions of runoff volume to continue as vacant or agricultural land is converted to urban use.

6.3.1.2 Public Streets, Roads and Highways

Tempe will continue with its street sweeping, routine street maintenance, and uncontained trash pickup programs. Long-term pavement management is facilitated by Tempe Engineering Division's Infrastructure Management Team. Details of these programs are found as noted in the Appendix.

Street Sweeping and Routine Street Maintenance: APP-15

Uncontained Trash Pickup: APP-16

Pavement Management: APP-17

*Numerical Index of this section follows the delineations in the Guidance Manual for preparation of Part 2 Application.

6.3.1.3 Flood Management Projects

Other than major retention basins in future development (residential single family) no new flood control projects are anticipated.

6.3.1.4 Municipal Waste Facilities

As stated in the Part 1 Application, there are no operating municipal landfills within the City of Tempe. Several closed landfills are being removed/remediated in conjunction with construction of the Red Mountain Freeway by the Arizona Department of Transportation (ADOT). These were shown on the Landfill Map in Appendix B, Page App. B.6 in the Part 1 Application. The landfills are SRP-75, SRP-78 and the Old Tempe landfill.

A NPDES permit for filter backwash water was recently obtained for the Papago Water Treatment Plant. The location is shown on a Map in the Appendix that was updated from the Part 1 Application Appendix. A copy of the permit (Permit No. AZ0023451) is also included for reference. See Appendix, P.P. APP-18, APP-19.

A sludge thickening and dewatering facility is currently being bid for the Papago Water Treatment Plant. It will reduce the volume of sludge from the flocculation settling basins that is currently being disposed of in a solid waste landfill. The process will involve dewatering the sludge to a solid brick form and reintroducing the water to the treatment plant. This will substantially reduce the volume of water being discharged under existing NPDES permit AZ0023451. The possibility of eliminating this permitted discharge will be explored upon completion of the dewatering facility and evaluation of the effectiveness of the process.

Several municipal facilities which have the potential for pollutant discharges have 100 year storm on-site retention as a BMP for storm water management. These facilities include the Kyrene Water Reclamation Plant (POTW), the South Tempe Water Treatment Plant (potable water supply), and the Traffic Operations Maintenance Yard.

The Priest Yard (Field Services and Equipment Maintenance Division) has a site specific point source discharge and has applied for coverage under a general NPDES permit. This site will be developing an SWPPP and complying with on-site BMP's.

Other sites, the Kiwanis Park Maintenance Yard, and the golf course maintenance yards are not regulated by the NPDES program (i.e. not in the 11 industrial categories). Aquifer Protection Permits for some of these facilities will eventually be required under the state program. They will be managed under the BMP's established for our regulated facilities.

6.3.1.5 Pesticides, Herbicides and Fertilizers

Certification for commercial applicators is administered by the State of Arizona, Structural Pest Control Commission (See Appendix P.P. APP-20). Education of the general public (in conjunction with household hazardous waste collection information) will be used to attempt to improve do-it-yourself application. Tempe's use of pesticides and herbicides in buildings, on facility sites and rights of ways are discussed in the Appendix P.P. APP-21. The City has already reduced application dosage for contact herbicide. A pilot study for other methods of weed control will be initiated.

There may be an increase in the total chemicals used due to the new development of parks and street landscape that accompanies urbanization. We will continue to find ways to reduce chemical application rates and substitute less environmentally detrimental products and/or procedures.

6.3.2 Construction Sites

The construction site program is covered in the material in the Appendix P.P. APP-22. All new development is required to have onsite storm water retention for the 100 year storm event. Erosion and sediment transport is a minor concern due to flat gradients.

6.3.3 Program to Control Pollutants in Storm Water Discharges from Waste Handling Sites and Industrial Facilities

Our procedures for inspection and establishment of control measures for storm water discharges focus on the following priorities:

1. Notification of the Priority Industrial Facilities of the conditions in the proposed Storm Water Quality Management Ordinance.
 - a. The City of Tempe will request a list from Region IX EPA of received NOI's for comparison to our list of received NOI's.
 - b. The list of industrial activity facilities, as determined by the applicable SIC from the City of Tempe sales tax data, is being compared with the list of submitted industrial NOI's. Any discrepancies discovered regarding facilities which have inadvertently failed to send NOI's to the EPA will be notified to obtain coverage under the general NPDES permit.

2. Verification of the SWPPP per NPDES requirements.

Conduct initial site visits to Priority Industrial Facilities (PIF's) of concern to inventory storm water pollutant potential. Any applicable violations to the local Storm Water Quality Management Ordinance will be noted and handled in accordance with the Legal Authority guidelines. (See Draft Ordinance Appendix P.P. APP-2).

3. Establishment of a complete inspection procedure in accordance with the needs determined from the industrial site visits.

6.3.3.3. Establishing and Implementing Controls

Section 8-5-4 (A) of the proposed Storm Water Quality Management Ordinance will allow the City to implement any controls necessary to assure compliance with a NPDES permit. Educational pamphlets will be distributed to Priority Industrial Facilities focusing on the storage and handling of toxic chemicals. Storm water pollution prevention plans (SWPPP) will be reviewed during site visits. Discrepancies in BMP's for hazardous material storage and handling will be documented. It is anticipated that the establishment of a viable inspection and control implementation program will take two years.

6.3.3.4. Inspection and Monitoring

1. All new industry is required to provide 100 year storm water retention onsite, thereby basically eliminating the potential for discharging pollutants to the MS4.
2. Potential discharges to groundwater via drywells or other conveyances, will be referred to Arizona Department of Environmental Quality (ADEQ) for inclusion in the Aquifer Protection Permit (APP) Program. This applies to new and existing facilities. New designs will attempt to limit APP problems by restricting drywells from being located in loading docks and areas with potential exposure to pollutants.
3. Existing industrial facilities without 100 year onsite retention and having the potential for storm water pollutant discharges will be included on the P.I.F. list and regulated in accordance with the proposed Storm Water Quality Management Ordinance. The long-term monitoring program will respond to perceived pollution problems from site inspections and test data from the MS4 outfall monitoring sites.

6.4 Structural Controls

Large retention basins are the dominant structural control in the City of Tempe's storm water management system. The Section maps (1" = 200') that were submitted in the Part 1 Application show the locations of these devices. This information will be kept current as new development occurs throughout the permit term.

6.4.2 Maintenance Activities on Structural Controls (Retention Basins/Parks)

The major structural controls are large (greater than five (5) acres) storm water retention basins that are utilized as parks. Although not all parks are retention basins, the City of Tempe currently has approximately 400 acres of turf in its parks system. The parks maintenance section currently has 43 full time employees. These employees are responsible for all parks maintenance tasks and programs. The following is an overview of the Park Turf Maintenance schedules and programs:

I. Park Turf Maintenance

A. Mowing

Turf areas are mowed at an average of 1-1/2" to 2" in height which is the standard for Bermuda grass in sports turf. The grass clippings are not caught but left for mulch. Clippings are comprised of 75 to 80 percent water and 3 to 6 percent Nitrogen, 1/2 to 1 percent phosphorus and 1 to 3 percent potassium which are the same nutrients contained in most fertilizers. All turf areas are mowed weekly in the growing season and on an as needed basis during the remainder of the year. (The growing season is normally April 1st through October 15th.)

B. Edging

During the growing season, walks, buildings, curbs, trees and fence lines are edged at the same time turf areas are mowed. A herbicide chemical is used as an edger whenever possible. The chemical product currently used is Round-Up and is applied at the recommended EPA rates and label guidelines.

C. Fertilizer

Sprinkler and flood irrigated areas are fertilized during the growing season. The University of Arizona Turf Department recommends one pound of Nitrogen per 1,000 square feet for Bermuda grass. The fertilizer applied is water soluble and primarily a granular ammonia sulfate. This product is applied using a broadcast spreader after the correct calibration has been set. Soil samples and tissue analysis are also used to help determine application time tables. Currently, there are some areas which have the capabilities to inject products using the irrigation system. When liquid chemical fertilizer is used, it is applied in small applications over several nights to eliminate waste and run-off. This is accomplished with programmable irrigation controllers and multiple start times for each station.

D. Cultivation, Turf

Areas are cultivated in the spring and fall using open core tines that produce a plug. This turf procedure is the working of the soil without destruction of the turf; i.e. coring, slicing, grooving, forking and shattering. This process allows for better infiltration of turf products applied to the soil; i.e. water, fertilizers, chemicals, and soil amendments.

E. Reseeding

Reseeding is done at least once or twice a year, early spring for summer grasses, and mid-October for winter grasses.

F. Leaf Removal

Leaf removal is done annually and as needed during the fall. We currently have a pilot compost program to recycle some of these leaves to develop mulch.

G. Weed Control

Twice per year using the herbicide Surflan. Surflan is mixed with Round-Up using the recommended EPA rates and following the product labels. These products are applied by City staff who have been certified by the Arizona Structural Pest Control Commission. These certified applicators are required to follow all product label guidelines. See Section 6.3.1.5.

H. Watering

The six types of watering systems are sprinkler, flood, quick couplings, hose bib, bubbler and drip irrigation. Sprinkler systems are on varying schedules based on area needs. Schedules are affected by seasonal changes. Sprinklers operated during the growing season are scheduled for early morning and late evening. Complete irrigation time tables are available from the Park Maintenance Section. Flood systems are utilized year round.

Following a schedule of twice a month during the growing season and once a month through the winter. Quick couplings and hose bibs are used in areas where flood or sprinkler systems are not available. They are used throughout the year. Bubbler and drip irrigation systems are used primarily in City rights of way landscaped areas that are mostly arid region native species. These are operated according to the season or plant needs. The City of Tempe currently operates its turf maintenance program under several guidelines and references. This program is sustained by using material written by turf professionals and studies completed by various organizations. The following list of reference materials reflects the maintenance standards used by the City of Tempe. These references are also guidelines for future projects to improve the water and turf quality at various City locations.

References:

1. Turf Management for Golf Courses by James B. Beard, Professor of Turfgrass Science Texas A & M University
2. Soils & Soil Management (second edition) Charles D. Sopher Ph.D./Jack V. Baird Ph.D.
3. Turfgrass Management revised Edition A.J. Turgeon
4. Reclaimed Water Study for Kiwanis Park and Ken McDonald Lakes. City of Tempe Project No. 896295A-1991 Wilson and Co.

5. Lake Management guide for Kiwanis Park Lake and Ken McDonald Golf Course, February 1991, Wilson and Company, Phoenix, AZ/Aquatic Consulting and Testing, Inc., Tempe, AZ
6. University of Arizona, Dr. Kopec

Organizations:

1. National Golf Course Superintendents Association
2. Cactus & Pine Golf Course Superintendents Assoc. of Arizona
3. National Parks and Recreations Association Park Maintenance Division
4. Arizona Parks and Recreations Association - Park Maintenance Section

6.5 Program and Schedule to Detect and Remove Illicit Discharges and Improper Disposal

6.5.1 Prohibiting Illicit Discharges

In accordance with the proposed Storm Water Quality Management Ordinance illicit discharges and improper disposal are specifically prohibited. Site inspections under Section 6.3 will have as one primary focus, the detection of illicit discharge connections and equipment, such as retention basin pumping apparatus and disturbed containment berming or illegal retention basin altering per Ordinance 819/93.03.

All discharges to the MS4 or to the City Rights of Way will require permits and will only be allowed under the supervision of Tempe inspectors. The composition of any discharges will be required to be verified by the applicant prior to issuance of these types of permits.

6.5.2. Field Screening

Duration of permitted discharges will be time specific to allow for monitoring by City inspectors and to limit potential flooding problems. Permanent discharge connections to the MS4 will not be permitted. Existing permitted permanent connections to the MS4 will be regularly inspected for the potential to discharge pollutants to the MS4. If the potential exists the connection will be required to be removed at the owners expense. In most cases a drywell will need to be installed to replace the discharge connection. This will be regulated under the State APP program.

6.5.3 Investigation of Potential Illicit Discharges

Illicit discharges will be immediately terminated per the proposed Storm Water Quality Management Ordinance until the conditions of a permitted discharge can be met (Section 6.5.1). This will require an analysis of the composition of the discharge for fecal coliform, fecal streptococcus, surfactants, residual chlorine, fluorides and potassium. Continual point source monitoring will be required if pollution and safety considerations are determined from preliminary sampling or if any on-site treatment is required to obtain the permit. All monitoring and analysis will be the responsibility of the industrial applicant.

6.5.4 Spill Response and Prevention

The Tempe Fire Department provides response to incidents that involve hazardous materials or wastes. The Fire Department and the Fire Department's Hazardous Materials Response Team function within the department's standard operating procedures, which in Volume Two, Section Eight, provides specific guidelines for hazardous materials incidents, including the control of run-off into storm sewers. (See Appendix P.P. APP-23, Tempe Fire Department Standard Operating Procedure, 208.01, Page 6). Fire Department personnel are trained and equipped to contain and prevent spills from entering storm sewers.

Each Fire Department engine company has several methods available to prevent spills from entering storm sewers. Techniques which can be utilized include:

- * Tarps can be placed over a storm sewer inlet in conjunction with dirt to weight the tarp.
- * Large diameter hose in conjunction with dirt can be used to create a dike around an inlet.
- * Large volume spills may be controlled by utilizing ground ladders and a salvage cover.
- * Every company carries at least two shovels that can be used to dig diversion channels or build dirt dams and dikes.
- * Each ladder company carries two 50 foot lengths of plastic dike.

The Fire Department's Hazardous Materials Response team consists of 24 members and one program manager (See Appendix P.P. APP-24, Organizational Chart) trained to the technician level in accordance with OSHA Rule and NFPA Standard 472. Eight members of the team are on duty at all times and additionally the shift commanders have had hazardous materials technician training. The team can provide additional materials that can be used to protect storm sewer inlets, such as: absorbent booms and pillows, neutralizing agents, activated carbon, an adsorbent powder (safestep), and "Plug-N-Dyke" powder. The Hazardous Materials Response Team also has additional training and equipment to contain a spill at the source of a leak, thereby minimizing the runoff problem. The team works closely with the Arizona Department of Environmental Quality and the City of Tempe's Environmental Service Division in ensuring that run-off is contained and disposed of properly. (See Appendix P.P. APP-25, Tempe Fire Department Standard Operating Procedure, 208.01A, Pages 8 and 9).

The Tempe Fire Department is committed to a progressive approach in managing hazardous material emergencies. The department's commitment is clearly outlined in its Five-Year Plan. (See Appendix P.P. APP-26, Five Year Plan, Section 8). Large capital expense purchases for the Hazardous Materials Response Team are also listed in the Five Year Plan, Section 8.

6.5.5 Public Awareness and Reporting Programs

6.5.6 Proper Management of Used Oil and Toxics

Potential dischargers which use petroleum products and toxic materials onsite will be listed on the Priority Industrial Facility list. These facilities will all be regularly inspected, along with any monitoring required, to assure that these materials are not being disposed of to the ground, right of way, or the MS4.

As a part of the public awareness program (Section 6.5.5), the primary focus will be on the proper handling of these materials for the do-it-yourself oil changer or pesticide applicator.

An on-going part of the overall storm water management program will be to establish better facilities for the proper disposal of used oils and toxics. This is identified as a major concern for the entire Phoenix metropolitan area. Currently there are several task forces at work on this problem and the City of Tempe will buy into the most economically and technologically feasible program developed.

Educational programs will be a large part of this component of the storm water management program. Developing and/or promoting disposal services for non-RCRA regulated generators will be another major goal.

For the next fiscal year we have applied to our City Council to fund approximately \$70,000 for a Household Hazardous Waste Collection Day. We have been staging these events for two years now, basically on an annual basis. See Appendix P.P. APP-27.

The City currently tracks and provides up-to-date information to the public on the status of private businesses which will accept used oil and any other substances for recycling or disposal from households and exempt Small Quantity Generators (SQG's).

6.5.7 Infiltration of Seepage

A phased program is dicussed in the Appendix P.P. APP-28.

ASSESSMENT CONTROLS

The City of Tempe will file annual reports to document the progress of our storm water management programs. The reduction in pollutant loading to the Waters of the U.S. has been discussed in Section 6.3.

Monitoring of the designated outfalls will allow us to characterize the discharge for pollutant parameters. Hopefully, historical data will indicate a reduction in controllable parameters.

FISCAL ANALYSIS

The information submitted in the Part 1 Application addressing funding sources remains viable. There is no immediate plan to develop a utility for storm water.

Tempe proposes to utilize existing or budgeted personnel to implement the program. We are experiencing an organization review to assess policy, staffing, procedures and equipment. The priority is to position the City for the '90s and beyond. The proposed program will need to be effective under resource constraints.

OTHER CONSIDERATIONS

Existing and proposed program components have been documented by material in the Appendix. This information (prepared by the "hands on staff") typically gives fiscal data and projections.

A large support effort is provided by Tempe's GIS database and its maintainers. See Appendix P.P. APP-29 and APP-30.

The proposed storm drain maintenance program is also documented. The actual program will not be fully realized until positions are filled, equipment is allocated and policies are finalized. Appendix P.P. APP-31.

Some enforcement activity may fall to the Code Enforcement Section of the Building Safety Department. Their function and the existing code are in the Appendix P.P. APP-32.

The Part 1 Application was lacking a complete drainage area land use analysis. This information is found in Volume 2 of the Appendix.

A contour map of the entire City was found in the archives. A copy of this 1964 document is in the Roll Maps.