

CITY OF BUCKEYE, ARIZONA

# Section 1 - Introduction

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PRETREATMENT PROGRAM SUBMITTAL

FINAL

7/1/2021



## Table of Contents

<b>1. Introduction</b>	<b>1</b>
1.1. Pretreatment Program Objectives .....	1
1.2. System Description.....	2
1.3. Overall Program Structure.....	3

## List of Appendices

Appendix 1-A Buckeye Organization Chart



# 1. Introduction

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## 1.1. Pretreatment Program Objectives

The National Pretreatment Program, as implemented under the Clean Water Act (CWA) and the General Pretreatment Regulations, 40 Code of Federal Regulations (CFR) Part 403, as delegated to the State of Arizona, are designed to control the discharge of industrial wastewater to Publicly Owned Treatment Works (POTWs). The discharge of toxic and other harmful pollutants from industrial sources can be effectively controlled through a local pretreatment program that is based on these regulations, structured to address specific local concerns, and enforced through a strong pretreatment ordinance.

The City of Buckeye, Arizona (City) owns and operates one wastewater treatment plant (WWTP) and three water reclamation facilities (WRF): Central Buckeye WWTP, Sundance WRF, Festival Ranch WRF and Tartesso WRF. The total combined design flow of the City's facilities exceeds five million gallons per day (MGD), triggering the Arizona Administrative Code (AAC) Title 18, Chapter 9, Article 9 requirements for development and implementation of a pretreatment program.

Referred to collectively as POTWs, the WWTP and WRFs receive wastewater from residential, industrial, commercial, and institutional users. As with other municipalities, the City's POTWs are vulnerable to discharge of toxic or harmful pollutants from users. The treatment facilities are designed to reduce the quantities of organic materials, solids, and nitrogen in the wastewater, making it suitable for reuse, for recharge to the aquifer, or for disposal to surface water. They are not designed to receive or remove many other pollutants which pose the risk of pass-through or interference. Pass-through occurs when pollutant concentrations or loadings in the POTW effluent exceed water quality criteria for reuse or disposal. Interference occurs when pollutants in the influent disrupt treatment operations or performance or compromise biosolids quality.

The objectives of the City's Pretreatment Program are to:

- To prevent the introduction of pollutants into the publicly owned treatment works that will interfere with its operation;
- To prevent the introduction of pollutants into the publicly owned treatment works that will pass through the publicly owned treatment works, inadequately treated, into receiving waters, or otherwise be incompatible with the publicly owned treatment works;

- To protect both publicly owned treatment works personnel who may be affected by wastewater and sludge in the course of their employment and the general public;
- To promote reuse and recycling of industrial wastewater and sludge from the publicly owned treatment works;
- To enable the city to comply with its national pollutant discharge elimination system permit conditions, sludge use and disposal requirements, and any other federal or state laws to which the publicly owned treatment works is subject.

## 1.2. System Description

The wastewater treatment and water reclamation facilities owned and operated by the city include Central Buckeye WWTP, Sundance WRF, Festival Ranch WRF, and Tartesso WRF, which together treat over 3 MGD of wastewater. Future facilities are anticipated to be constructed as the City grows.

The sewer system consists of over 270 miles of sewer lines, more than 6,400 manholes, and three lift stations. There are approximately 23,000 sewer connections. There are also multiple areas and individual residences and businesses that use septic systems.

### Central Buckeye WWTP

Located in Buckeye on Norton Drive, one mile south of City Hall, serves the south-central portion of the City. Its customers include residential, commercial, and industrial users. The WWTP has an annual average design capacity of 4.5 MGD. Estimated annual average influent flow is 1.55 MGD, based on data from April 2018 through March 2019.

Utilizing an advanced activated sludge process, the process removes organic material and solids well as nitrogen. Effluent from Central Buckeye WWTP undergoes filtration, chlorination, and dechlorination prior to discharge.

Review of planning documents and discussions with City staff indicated that portions of the Central Buckeye service area are slated for immediate industrial development.

### Sundance WRF

Located in the Sundance community near Dean Road and the Roosevelt Irrigation District (RID) Canal, this WRF serves the east portion of the City. Its customers include residential, commercial, and industrial users. Having an annual average design capacity of 3.47 MGD, it currently (2018-2019) treats an estimated annual average influent flow of 1.34 MGD. Effluent from Sundance WRF undergoes filtration and UV disinfection prior to reuse or discharge to the RID underground storage facility via canal.

### **Festival Ranch and Tartesso WRFs**

Festival Ranch WRF serves the residential community of Festival Ranch. The WRF has an annual average design capacity of 1.0 MGD. Current estimated annual average influent flow (based on 2017 flow data) is 0.25 MGD.

Effluent undergoes filtration and UV disinfection prior to reuse for irrigation or discharge to Wagner Wash, an ephemeral wash. Effluent discharged for reuse may be chlorinated to maintain residual chlorine necessary to prevent bio-clogging of the distribution system (ADEQ, June 2004). Reclaimed water from the WRF may be used to irrigate local golf courses and to replenish related irrigation and effluent-only lakes, under an agreement with Pulte Homes (Festival Ranch Reclaimed Water Master Plan, revised January 3, 2005). Excess effluent discharged to the ephemeral wash adjacent to the WRF may be periodic small-volume and/or of short duration, not to exceed a monthly average flow of 250,000 gpd, primarily during the winter months (ADEQ, August 2015).

Tartesso WRF serves the residential community of Tartesso. The WRF has an annual average design capacity of 1.2 MGD. Current estimated average influent flow (based on 2017 flow data) is 0.25 MGD.

Effluent is recharged to two percolation basins for reuse. The WRF's AZPDES permit was obtained to allow temporary discharge to an ephemeral stream tributary of the Hassayampa River in the event of an emergency or under wet weather conditions.

Review of planning documents and discussions with City staff indicated that the Festival Ranch and Tartesso service areas are currently non-industrial, and no industrial development is anticipated. The WRFs were included in the local limits study in response to past exceedances of effluent permit limitations.

### **1.3. Overall Program Structure**

In accordance with 40 CFR 403.8(f), the City's Pretreatment Program consists of the following elements, as described in the indicated chapters of this Pretreatment Program Submittal:

- Legal authority, as established by the Code of Ordinances the City of Buckeye, Arizona and Chapter 16, Sewer Utilities and Use of Public Sewer, to apply and enforce the requirements of relevant sections of the Clean Water Act and any regulations implementing those sections (*Chapter 2*)
- Local limits, as set forth in Chapter 16, Article 16-9-3 (*Chapter 3*)
- Procedures to ensure compliance with the requirements of a Pretreatment Program, as described in this Pretreatment Program Submittal, including identification of industrial

users (IUs) who might be subject to the Program and the character and volume of pollutants contributed to the POTW by these users (*Chapter 4*); notification of IUs of applicable pretreatment standards and other Program requirements; analysis of reports and notices submitted by IUs; sampling and analysis of IU effluent; evaluation of the need for slug discharge control plans (*Chapters 5 and 6*); and compliance with public participation requirements (*Chapter 9*)

- An Enforcement Response Plan (ERP) containing detailed procedures indicating how a POTW will investigate and respond to instances of industrial user noncompliance (*Chapter 7*)
- Sufficient resources and qualified personnel to carry out the required authorities and procedures (*Chapter 8*)

The City's Pretreatment Program will be implemented by the Water Resources Department, with assistance from the City Attorney, and the City Clerk as needed. The City's organization chart is shown as Appendix 1-A.

CITY OF BUCKEYE, ARIZONA

# Section 2 – Legal Authority

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PRETREATMENT PROGRAM SUBMITTAL

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## Table of Contents

<b>2. Legal Authority</b>	<b>1</b>
2.1 Background.....	1
2.2 Purpose and Policy .....	2
2.3 General Administration and Authorities (Article 16-1 through Article 16-7) .....	2
2.4 General Sewer User Requirements (Article 16-9) .....	3
2.5 Pretreatment of Wastewater (Article 16-10) .....	4
2.6 Wastewater Discharge Permits (Article 16-11) .....	4
2.7 Wastewater Discharge Permit Issuance Process (Article 16-12) .....	5
2.8 Reporting Requirements (Article 16-13) .....	6
2.9 Inspection and Compliance Monitoring (Article 16-14) .....	7
2.10 Confidential Information (Article 16-15) .....	7
2.11 Publication of Users in Significant Noncompliance (Article 16-16) .....	7
2.12 Administrative Enforcement Remedies (Article 16-17) .....	8
2.13 Judicial Enforcement Remedies (Article 16-18) .....	8
2.14 Supplemental Enforcement Action (Article 16-19) .....	8
2.15 Affirmative Defenses to Discharge Violations (Article 16-20) .....	8
2.16 Miscellaneous Provisions (Article 16-21) .....	9

## List of Appendices

Appendix 2-A Ordinance 07-21

Appendix 2-B Chapter 16 Sewer Utilities and Use of Public Sewers

Appendix 2-C City Attorney Legal Opinion

## 2. Legal Authority

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### 2.1 Background

The City of Buckeye, Arizona (City), as the Control Authority responsible for regulation of industrial users (IUs) that discharge to its collection system and wastewater treatment plants (WWTPs), must have the legal authority to develop and implement its pretreatment program. In 2021 the City of Buckeye, Arizona (City) revised Chapter 16, Sewer Utilities and Use of Public Sewers (Sewer Use Ordinance), of the City's Code of Ordinances (as adopted by Ordinance Number 07-21, April 6, 2021) to comply with all applicable federal, Arizona and local laws, including the Clean Water Act (33 United States Code [USC] Section 1251 et seq.) and the General Pretreatment Regulations (40 CFR 403) as well as carry out its specific responsibilities under 40 Code of Federal Regulations (CFR) 403.8(f)(1)(i-vii).

Required program procedures (and the specific provisions of Chapter 16 of the Sewer Use Ordinance that provides the basis for these procedures) are as follows:

- To deny or condition pollutant discharges from industrial users (IUs) to the City's POTW that do not meet pretreatment standards or would cause POTW permit violations (Section 16-9-1A).
- To require IU compliance with applicable standards and requirements (Sections 16-9-1B, and 16-9-2 through 16-9-5).
- To control through permit, order, etc. the contribution of pollutants from IUs to the City's POTW (Sections 16-10-2, 16-11, and 16-12).
- To develop and enforce compliance schedules for the installation of technology required to comply with applicable standards and requirements (Section 16-13-1B4).
- To require, receive, and analyze self-monitoring reports and other notices from IUs (Section 16-13-4).
- To carry out inspection and monitoring (Section 16-14).
- To comply with the confidentiality requirements set forth in 40 CFR 403.14 (Section 16-15).
- To obtain administrative and judicial remedies for noncompliance by any IU with any pretreatment standard or requirement (Sections 16-17, 16-18, and 16-19).

All IUs discharging to the collection system are subject to regulation. The City is authorized to implement program requirements under 40 CFR 403 and to enforce local limits to prevent pass through and interference. The Chapter incorporates all enforcement authorities allowable under State law.

Sections 2.2 through 2.17 summarize the key elements of each section of Sewer Use Ordinance Chapter 16. Copies of Ordinance No. 07-21, Chapter 16 and the statement from the City Attorney regarding the City's authority to implement the Pretreatment Program, are provide in Appendix 2-A, Appendix 2-B and Appendix 2-C respectively.

## **2.2 Purpose and Policy**

Chapter 16 presents the purpose and policy of the Pretreatment Program:

- To prevent the introduction of pollutants into the Publicly Owned Treatment Works that will interfere with its operation;
- To prevent the introduction of pollutants into the Publicly Owned Treatment Works that will pass through the Publicly Owned Treatment Works, inadequately treated, into receiving waters, or otherwise be incompatible with the Publicly Owned Treatment Works;
- To protect both Publicly Owned Treatment Works personnel who may be affected by wastewater and sludge in the course of their employment and the general public;
- To promote reuse and recycling of industrial wastewater and sludge from the Publicly Owned Treatment Works;
- To provide for fees for the equitable distribution of the cost of operation, maintenance, and improvement of the Publicly Owned Treatment Works; and
- To enable the city to comply with its AZPDES (Arizona Pollutant Discharge Elimination System) permit conditions, sludge use and disposal requirements, and other Federal and State laws to which the Publicly Owned Treatment Works is subject.

## **2.3 General Administration and Authorities (Article 16-1 through Article 16-7)**

- Article 16-1 establishes the authority of the Director of Water Resources and the scope of Sewer Service.
- Procedures and conditions for obtaining sewer service are described in Article 16-2.
- Discontinuance of Service is provided for in Article 16-3.

- Article 16-4 contains the definitions of terms used throughout the Sewer Use Regulations.
- Article 16-5 sets forth the respective responsibilities of the Department and the Consumer with respect to the user's building sewer and connections, private sewage systems, tampering, and requirements connect to the public sewer.
- Article 16-6 is reserved
- Article 16-7 sets forth a system of user charges and fees.
- Article 16-8 is reserved

## **2.4 General Sewer User Requirements (Article 16-9)**

The General Sewer Use Requirements sets forth applicable discharge standards and establishes the City's right of revision and limit on dilution, as follows:

- General prohibited discharge standards. Applicable to all users, discharges of any water or waste that could cause a Pass Through or Interference are prohibited.
- Specific prohibited discharge standards. The specific prohibitions identify limits for types of constituents and wastewater characteristics, including fire and explosion hazards; wastes with high or low pH; solid or viscous pollutants capable of causing obstructions; excessive flow rate or concentration; high-temperature wastes; petroleum and non-biodegradable cutting oils and mineral oils; toxic gases, vapors and fumes; and trucked or hauled waste, among others.
- National categorical pretreatment standards and State pretreatment standards. Section 16-9-2 requires users to comply with applicable categorical standards.
- Local limits. This section incorporates local industrial pretreatment limitations (local limits) as described in Chapter 3 of this Pretreatment Program Submittal.
- Right of revision. The City is given the right to establish, by ordinance or in wastewater discharge permits, more stringent standards or requirements on discharges to the collection and treatment system.
- Prohibition on dilution. Users are prohibited from diluting their wastestreams in order to partially or fully achieve compliance with established effluent limitations.

## 2.5 Pretreatment of Wastewater (Article 16-10)

Article 16-10, Pretreatment of Wastewater, presents the following requirements for SIUs and other sewer users:

- Pretreatment facilities. Users are required to provide wastewater treatment as necessary to comply with the ordinance, including BMPs.
- Additional pretreatment measures.
  - The Director may restrict peak discharges, designate discharge locations, or require separation of industrial and domestic wastewater; require equalization; require pretreatment for grease, oil, sand, lint, and/or other materials; require installation of combustible gas detection meters; and require installation of sampling manholes.
  - Section 16-10-2-B establishes requirements to install grease, oil and sand interceptors or traps whenever the Directory determines such devices are necessary. This section also establishes requirements for device sizing, construction, and maintenance and for record keeping requirements.
- Accidental discharge/slug control plans. The Director may require SIUs to submit accidental discharge/ slug control plans.

## 2.6 Wastewater Discharge Permits (Article 16-11)

Article 16-11 describes the process by which users apply for wastewater discharge permits and establishes the authority of the Director to issue permits to carry out the purposes of the Chapter. Sections specifically describe:

- Wastewater analysis. Users must submit information on the nature and characteristics of its wastewater, when requested by the Director.
- Wastewater discharge permit requirement.
  - SIUs are required to obtain wastewater discharge permits;
  - other users may be required to obtain permits, at the discretion of the Director;
  - The Director is authorized to issue four classes of Permits:
    - Class I Permits will be issued to SIUs
    - Class II Permits may be issued to users other than SIUs whose discharge contains a high mass level of BOD, TSS or TKN.

- Class III Permits may be issued to facilities performing categorical operations but does not discharge process wastewater or whose discharge meets the definition of a Non-Significant Industrial User;
- Class IV Permits or General Permits may be issued to non-SIU or commercial users.
- Violations of the Permit terms or conditions are violations of Chapter 16 and are subject to the enforcement actions specified in the Chapter.
- Wastewater discharge permitting. Existing and new connections must apply for permits within specified time frames.
- Wastewater discharge permit application contents and other information. The type of information that may be required of users is described.
- General Permits (Class IV) may be issued by the Director to non-SIU or commercial user dischargers.
- Application signatories and certification. Certification of accuracy and completeness of information submitted as part of the permit application are required, and personal liability is assigned to the signee.
- Wastewater discharge permit decisions. The Director must approve or deny the permit application or place conditions or restrictions on discharges within a specified time frame.

## **2.7 Wastewater Discharge Permit Issuance Process (Article 16-12)**

Article 16-12 , Wastewater Discharge Permit Issuance Process, describes the process by which the Director issues permits, as follows:

- Wastewater discharge permit duration. Duration may not exceed five years.
- Wastewater discharge permit contents. Specific conditions as are deemed reasonably necessary by the Director to prevent Pass Through or Interference information are established in the Permit.
  - Permit duration
  - Effluent limits and/or requirements for BMPs
  - Self-monitoring and sampling requirements
  - Reporting requirements
  - Special conditions

- Management of toxic pollutant and control slug discharges may be included
- Wastewater discharge permit appeals. Conditions for appeals to reconsider permit terms are given.
- Wastewater discharge permit modification. Reasons for which the Director may modify permits (e.g., new standards, changes in user's operations, violations) are given.
- Wastewater discharge permit transfer. Conditions for permit transfer are given.
- Wastewater discharge permit revocation. Reasons for which the Director may revoke permits (e.g., failure to notify of significant changes in operation; falsifying self-monitoring reports; refusing access; failure to meet effluent limitations, pay fines, or pay sewer charges).
- Wastewater discharge permit reissuance. Submittal of a complete permit application for reissuance is required.

## **2.8 Reporting Requirements (Article 16-13)**

Article 16-13, Reporting Requirements, describes reporting activities required of users, as well as standards for sample collection, sampling and analysis, and recordkeeping, as follows:

- Baseline monitoring requirements. Categorical industries are required to submit a report explaining how they will meet any new categorical discharge standards.
- Compliance schedule progress reports. Categorical industries are required to report on progress towards implementing additional pretreatment and/or operations and maintenance required to meet new categorical discharge standards in accordance with the compliance schedule.
- Reports on compliance with categorical pretreatment standard deadline. Existing categorical industries with new categorical discharge standard or new categorical dischargers are required to report flow measurement, measurement of pollutants, and certification as to whether or not pretreatment standards are being met consistently.
- Periodic compliance reports. The Director may require SIUs and other users to provide sampling and analyses at their own expense and to report results.
- Reports of changed conditions. Users are required to notify the Director prior to any significant changes to operations or to the system that would affect wastewater discharges.

- Reports of potential problems. Users are required to notify the Director of potentially problematic discharges.
- Reports from unpermitted users. The Director may require reports from all users not required to obtain a wastewater discharge permit.
- Notice of violation/repeat sampling and reporting. Users are required to notify the Director of violations within 24 hours of becoming aware of the violation and to repeat sampling under certain conditions.
- Procedures for notification of the discharge of hazardous waste.
- Analytical requirements. Standards for sampling and analysis are set.
- Sample collection. Requirements for sample collection are set.
- Timing. “Date received” for written reports is defined.
- Recordkeeping. Records are required to remain available for three years.
- Certification Statements. Requirements for certification of various applications, reports, requests, etc. are established.

## **2.9 Inspection and Compliance Monitoring (Article 16-14)**

Article 16-14, Inspection and Compliance Monitoring describes right of entry for inspection and sampling of user facilities, obtaining digital images, examination and copying of records, and performance of additional duties, and allows the Director to seek a search warrant, if necessary. This Article also sets out the user’s rights during any inspection.

## **2.10 Confidential Information (Article 16-15)**

Article 16-15, Confidential Information, makes information and data from a user available without restriction to the public unless the user demonstrates that release is entitled to protection. A request for confidentiality must be made when the information or data are submitted; however, information and data are to be made immediately available to government agencies for uses related to the APP, the AZPDES permit, and the Pretreatment Program even if confidentiality has been requested and approved.

## **2.11 Publication of Users in Significant Noncompliance (Article 16-16)**

Article 16-16, Publication of Users in Significant Noncompliance, defines under what conditions users are in significant noncompliance and requires annual publication of a list of users in significant noncompliance in the largest daily newspaper published in the City.

## **2.12 Administrative Enforcement Remedies (Article 16-17)**

Article 16-17, Administrative Enforcement Remedies, addresses notices of violation (NOVs), consent orders, notices to show cause, compliance orders, cease and desist orders, administrative fines for violations and for unpaid charges, fines, and penalties, emergency suspensions of service and termination of discharge.

## **2.13 Judicial Enforcement Remedies (Article 16-18)**

Article 16-18, Judicial Enforcement Remedies, addresses injunctive relief, civil penalties, and criminal prosecution for noncompliance with the pretreatment ordinance. Remedies are non-exclusive; i.e., penalties are cumulative and the Director is empowered to take more than one enforcement action against any noncompliant user.

## **2.14 Supplemental Enforcement Action (Article 16-19)**

Article 16-19, Supplemental Enforcement Action, allows the Director to impose additional enforcement actions against noncompliant users, including penalties for late reports, performance bonds, liability insurance, severance of water supply, declaration of public nuisance, informant rewards, and/or prohibiting or terminating contracts with users that have not achieved compliance with applicable pretreatment standards and requirements.

## **2.15 Affirmative Defenses to Discharge Violations (Article 16-20)**

Article 16-20, Affirmative Defenses to Discharge Violations, defines conditions under which users may claim an affirmative defense to discharge violations. They include:

- Upset if the facility at the time of the upset was being operated properly. An Upset is an exceptional incident in which there is unintentional and temporary noncompliance with categorical pretreatment standards because of factors beyond the reasonable control of the user.
- Unanticipated violation of the specific prohibited discharge standards if user is in compliance with local limits or if the nature or constituents of the discharge has not changed substantially from when the City was in compliance with its APP, AZPDES permit, or other permit conditions.
- The section also defines conditions for bypasses, which are prohibited unless unavoidable to prevent serious consequences and there are not feasible alternatives. Bypasses may not cause violations.

## **2.16 Miscellaneous Provisions (Article 16-21)**

Article 16-21, Miscellaneous Provisions, allows adoption of reasonable fees for reimbursement of costs of setting up and operating the City's pretreatment program, including permit application fees, fees for monitoring, inspection, and surveillance procedures, fees for accidental discharge review and response, and fees for filing appeals. It also addresses severability: If an ordinance provision is invalidated, other provisions continue in effect.

# Buckeye PPS Section 3 Local Limits

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# Contents

List of Tables.....	5
List of Abbreviations .....	6
<b>Executive Summary .....</b>	<b>7</b>
Section 1 Introduction .....	12
1.1 Project Background.....	12
1.2 Project Purpose .....	13
1.3 Wastewater Treatment and Collection System.....	14
1.3.1 Central Buckeye WWTP .....	14
1.3.2 Sundance WRF.....	14
1.3.3 Festival Ranch and Tartesso WRFs.....	15
1.4 Industrial Users.....	16
1.5 Local Limits Sampling and Analysis.....	17
1.5.1 Central Buckeye WWTP .....	17
1.5.2 Sundance WRF.....	18
1.6 Project Methodology .....	18
1.7 Report Organization.....	19
<b>Section 2 Identification of Pollutants of Concern .....</b>	<b>20</b>
2.1 Introduction.....	20
2.2 Potential Pollutants of Concern.....	21
2.2.1 Regulatory Review .....	21
2.2.2 Other Considerations .....	23
2.2.3 Methodology .....	24
2.2.4 Results of Screening and Preliminary MAHL Analyses.....	25
<b>Section 3 Flow and Load Analysis.....</b>	<b>30</b>
3.1 Introduction.....	30
3.2 Flow Analyses .....	30
3.3 Load Analyses .....	31
<b>Section 4 Removal Efficiencies.....</b>	<b>33</b>
4.1 Introduction.....	33
4.2 Methodology .....	33
4.3 Selection of Representative Removal Efficiency Values .....	34

<b>Section 5 Maximum Allowable Headworks Loading (MAHL) Analyses .....</b>	<b>37</b>
5.1	Introduction..... 37
5.2	MAHL Analyses of Toxic Pollutants--Method..... 37
5.2.1	Determine Relevant Variables..... 37
5.2.2	Select AHL Equations ..... 38
5.2.3	Calculate AHLs ..... 40
5.3	MAHL Analyses of Toxic Pollutants - Results and Comparisons..... 40
5.3.1	Results..... 40
5.3.2	Comparison of Influent Loadings and MAHLs ..... 43
5.4	MAHL Analysis Method and Results for Conventional Pollutants..... 46
5.4.1	Results..... 46
5.4.2	Comparison of Influent Loadings and MAHLs ..... 47
<b>Section 6 Control Strategies.....</b>	<b>48</b>
6.1	Introduction..... 48
6.2	Numeric Limits and Other Control Strategies: Toxic Pollutants..... 49
6.2.1	MAIL Analyses..... 49
6.2.2	Numeric Limits..... 50
6.2.3	Other Control Strategies for Toxic Pollutants..... 54
6.2.4	Summary of Numeric Limits and Other Control Strategies for Toxic Pollutants ..... 54
6.3	Numeric Limits and Other Control Strategies: Conventional Pollutants and Nutrients 55
6.4	Control Strategies: Oil and Grease..... 56
6.5	Summary of Control Strategies..... 57
6.6	Sampling, Reviews, Re-evaluations and Updates ..... 58
6.6.1	Sampling..... 58
6.6.2	Investigations..... 59
6.6.3	Reviews of New Users..... 59
6.6.4	Annual Reviews..... 60
6.6.5	Industrial User Survey ..... 60
6.6.6	Re-evaluations and Updates..... 60
6.6.7	Other Actions..... 60
<b>Section 7 Implementation of Local Limits.....</b>	<b>61</b>
7.1	Control Strategies ..... 61
7.1.1	Toxic Pollutants..... 61

7.1.2	Conventional Pollutants .....	61
7.1.3	Oil and Grease .....	61
7.1.4	Summary of Control Strategies.....	62
7.2	Other Ongoing Activities .....	63
7.2.1	Sampling.....	63
7.2.2	Investigations.....	63
7.2.3	Reviews and Industrial User Survey.....	63
7.2.4	Re-evaluations and Updates.....	63
7.2.5	Other Actions.....	64
<b>Section 8 Works Cited .....</b>		<b>65</b>

## List of Tables

Table ES.1 Comparison of Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances .....	10
Table 2.1. AZPDES Permits and APPs in Effect, City Facilities .....	21
Table 2.2. Summary of Potential Pollutants of Concern Based on Water Quality Criteria .....	26
Table 2.3. Site-Specific Pollutants of Concern based on Inhibition, Central Buckeye WWTP and Sundance WRF .....	27
Table 3.1 Summary of Estimated Wastewater Flows (MGD) Central Buckeye WWTP .....	31
Table 3.2 Summary of Estimated Wastewater Flows (MGD), Sundance WRF .....	31
Table 4.1 Summary of Calculated Removal Efficiencies at Central Buckeye WWTP and Literature-Based Removal Efficiencies .....	35
Table 4.2 Summary of Calculated Removal Efficiencies at Sundance WRF and .....	36
Table 5.1 MAHL Summary for Toxic Pollutants, Central Buckeye WWTP .....	41
Table 5.2 MAHL Summary for Toxic Pollutants, Sundance WRF .....	42
Table 5.3 Comparison of Influent Loads and MAHLs for Toxic Pollutants .....	43
Table 5.4 Comparison of Influent Loads and MAHLs for Toxic Pollutants .....	44
Table 5.5 Comparison of Drinking Water and Influent Wastewater Concentrations .....	45
Table 5.6 MAHL Summary and Comparison of Influent Loads and MAHLs for .....	47
Table 6.1 Uniform Concentration Limits (UCLs, mg/L), Toxic Pollutants of Concern .....	52
Table 6.2 Comparison of Recommended Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances .....	57
Table 7.1 Comparison of Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances .....	62

## List of Abbreviations

A&Wedw	aquatic and wildlife, effluent-dependent waters	MCLs	maximum contaminant levels
ADEQ	Arizona Department of Environmental Quality	mg/L	milligram per liter
ADRE	average daily removal efficiency	MGD	million gallons per day
ADWR	Arizona Department of Water Resources	MPL	mass-based proportion limit
AgI	agricultural irrigation	MRE	mean removal efficiency
AgL	agricultural livestock watering	PBC	partial body contact
AHL	allowable headwork loadings	POCs	pollutants of concern
APPs	aquifer protection permits	POTW	publicly owned treatment works
AWQS	aquifer water quality standards	RID	Roosevelt Irrigation District
AZPDES	Arizona pollutant discharge elimination system	Rpotw	estimate of POTW removal efficiency
BID	Buckeye Irrigation District	Rprim	removal efficiency from headworks to primary treatment effluent
BMPs	best management practices	SBR	sequencing batch reactors
BMR	baseline monitoring report	SIUs	significant industrial users
BOD	biological oxygen demand (5 day)	SS	suspended solids
CFL	concentration-based contributory flow limit	SWQS	state water quality standards
CFR	Code of Federal Regulations	TCLP	toxicity characteristics leaching procedure
FOG	fats, oil and grease	TDS	total dissolved solids
FSF	food service facilities	TKN	Total Kjeldahl Nitrogen
gpapd	gallons per acre per day	TMDL	total maximum daily load
gpd	gallons per day	TPH	total petroleum hydrocarbons
gpm	gallons per minute	TSS	total suspended solids
IIA	individual industrial allocation	UCL	uniform concentration limit
IU	industrial user	ug/L	micrograms per liter
IUS	industrial user survey	USEPA	U.S. Environmental Protection Agency
lb/d	pounds per day	UV	ultraviolet
lb/MG	pounds per million gallons	VSF	vehicle service facilities
MAHLs	maximum allowable headworks loadings	WRF	water reclamation facility
MAIL	maximum allowable industrial loadings	WWTP	wastewater treatment plant

# Executive Summary

This report documents the development of local limits for the City of Buckeye (City), Arizona publicly owned treatment works (POTW). Under the National Pretreatment Program (40 Code of Federal Regulations [CFR] Part 403), POTWs with design capacities exceeding 5 million gallons per day (MGD) must establish pretreatment programs to control industrial wastewater discharges to their facilities. These local programs enforce national pretreatment standards and any more stringent local requirements necessary to protect site-specific conditions.

This report has been reviewed by Arizona Department of Environmental Quality (ADEQ) and was approved by ADEQ on August 26, 2020. The report was subsequently revised to reflect the May 6, 2021 adoption of City Ordinance 07-21.

## Project Background

The City's POTW includes four facilities and their collection systems.

- Central Buckeye Wastewater Treatment Plant (WWTP)
- Sundance Water Reclamation Facility (WRF)
- Festival Ranch WRF
- Tartesso WRF

The total combined flow capacity of these four facilities exceeds 5 MGD, triggering the requirement for the City to establish a pretreatment program, including the development and enforcement of technically based local industrial pretreatment limitations (local limits).

## Project Purpose

Local limits play a key role in the implementation of Federal and State Pretreatment Programs. Through the local limit development process, generally prohibited discharge standards (40 CFR 403.5(a)) and specific discharge standards (40 CFR 403.5(b)) are translated into site-specific controls. The purpose of this project is to define, characterize, and reduce potential threats posed by non-domestic discharges to the City's POTW, including facilities and their collection systems, through development of local limits.

## Project Approach

The project approach utilizes the maximum allowable headworks loading (MAHL) method set forth in the United States Environmental Protection Agency (USEPA) Local Limits Development Guidance Manual, published in 2004. The MAHL is the estimated maximum amount of a pollutant the POTW can receive without jeopardizing any criterion or otherwise causing pass through or interference. The ability of a wastewater treatment plant or water reclamation facility to remove heavy metals, other toxic inorganic and organic pollutants, and conventional pollutants and nutrients is the basis of the MAHL method.

The method consists of the following steps:

1. **Identify pollutants of concern (POCs).** To determine which pollutants might pose site-specific risks to the POTW, historical influent, effluent and sludge data are compared to applicable environmental criteria, such as effluent permit limits, water quality standards, and sludge

disposal limitations. Where data gaps exist, additional sampling at the WWTP/WRF and in the collection system is conducted.

2. **Analyze flow and load.** MAHL analyses require flow and concentration data from multiple locations. The flow and load analyses characterize fractions of influent flow contributed by residential, mixed commercial and industrial users and typical pollutant discharge concentrations for each of these sectors.
3. **Analyze removal efficiencies.** The ability of the POTW to remove each pollutant is quantified through calculation of removal efficiencies for each POC, based on site-specific sampling data.
4. **Analyze MAHLs and develop MAHL-based numeric limits.** For each applicable environmental criterion (for example, an effluent permit limitation), an allowable headworks loading, or AHL, is calculated. The AHL is the amount of pollutant the POTW can receive without jeopardizing that criterion. The largest amount of pollutant that the POTW can receive without jeopardizing any applicable criterion is the MAHL. A portion of the MAHL is reserved for uncontrolled sources (such as residential users), a safety allowance and, depending on the maturity of the service area, a growth allowance. The remaining MAHL is allocated to controlled sources through numeric limits.
5. **Develop control strategies.** In certain cases, MAHL-based numeric limits may not be appropriate or effective. In these cases, alternate control mechanisms, such as best management practices, are considered.

## Wastewater Treatment and Collection System

Central Buckeye WWTP has an annual average design capacity of 4.5 MGD. Effluent is discharged to one of three outfalls: Outfall 002, a lateral of Buckeye Canal; Outfall 003 Roosevelt Canal; and Outfall 004, Buckeye Canal, tributary to the Arlington Canal, which is tributary to the Middle Gila River. Dewatered sludge is landfilled.

Sundance WRF has an annual average design capacity of 3.47 MGD. Effluent is reused for irrigation or discharged to Wagner Wash, an ephemeral wash. Dewatered sludge is landfilled.

Festival Ranch WRF has an annual average design capacity of 1.0 MGD. Effluent is reused for irrigation or discharged to Wagner Wash. Dewatered sludge is landfilled.

Tartesso WRF has an annual average design capacity of 1.2 MGD. Effluent is discharged to two percolation basins or to the Hassayampa River. Sludge is hauled off site.

In 2018, the City initiated an Industrial User Survey (IUS) to identify potential significant industrial users (SIUs) and to refine its understanding of the non-domestic wastewater discharges to its treatment facilities. Municipal facilities, golf courses, and WalMart Distribution Center were identified as high-volume users. No non-domestic wastewater dischargers met the flow criterion for SIUs. To date no SIUs have been identified within the City limits, including non-sewered areas.

In March and April 2019, the City conducted intensive sampling events at Central Buckeye WWTP and Sundance WRF and their service areas to characterize influent and effluent flows and loads. Data from those sampling events was used to develop the local limits summarized in this report.

## Identification of Pollutants of Concern

United States Environmental Protection Agency (USEPA) considers 15 pollutants to be of national concern: arsenic, cadmium, chromium, copper, cyanide, lead, mercury, molybdenum, nickel, selenium, silver, zinc, biochemical oxygen demand (BOD), total suspended solids (TSS) and ammonia. Additional potential POCs were identified by reviewing relevant permits and regulations and by interviewing City staff to determine critical issues.

Potential POCs were technically screened using a method that compared observed pollutant concentrations to environmental criteria, followed by preliminary MAHL analyses. For Central Buckeye WWTP and Sundance WRF, national POCs were retained for further analysis except for molybdenum and silver. There were no relevant environmental criteria for these two pollutants. Chloride and TDS were added as site-specific POCs. For Festival Ranch and Tartesso WRFs, development of MAHL-based local limits was not carried forward, based on the absence of existing users to which local limits would apply, and City formal plans to maintain the residential nature of these service areas.

## Flow and Load Analyses

Flow and load analyses were conducted to provide the basis for MAHL calculations, using flow data collected from April 2018 through March 2019, and pollutant concentration data from sampling events in April and March 2019. Collection system-to-influent mass balances and internal influent-to-biosolids/sludge mass balances were calculated to evaluate the accuracy of data as well as the validity of assumptions used in developing local limits.

## Maximum Allowable Headworks Loading (MAHL) Analyses

MAHL analyses were conducted for all toxic pollutants and for conventional pollutants except for oil and grease, which are not amenable to this type of analysis for Central Buckeye WWTP and Sundance WRF. Environmental criteria included water quality permit limits and State water quality standards, Federal sludge disposal concentration limits, and literature inhibition threshold values. Removal efficiencies were based on wastewater sampling conducted in March and April 2019. MAHL-based uniform concentration limits (UCLs) and user-specific limits were developed.

## Implementation of Local Limits

Regarding control strategies, the City will

- implement MAHL-based local limits for control of SIU discharges of arsenic, boron, cadmium, total chromium, copper, cyanide, fluoride, lead, mercury, selenium and zinc;
- implement MAHL-based local limits for control of discharges of BOD, TSS and TKN from high-strength users;
- require implementation of appropriate control measures, which may include pretreatment and/or best management practices (BMPs) for chloride and total dissolved solids (TDS), BOD, TSS and oil and grease;
- consider developing a general City-wide policy to address the impact of softening and reverse osmosis by large-volume users; and

- estimate discharge loads of boron, chloride, fluoride and TDS from proposed advanced water treatment facilities and reserve loading capacity accordingly.

Regarding sampling, the City will conduct both regular and targeted sampling and analysis to provide data necessary to track trends and to evaluate the potential of residential and non-residential users to discharge specific pollutants in the Festival Ranch service area.

Regarding investigations, reviews, the industrial user survey (IUS), re-evaluations and updates, the City will perform

- investigation of effluent limitation exceedances and unusual levels of POCs;
- reviews of new IU and non-SIU dischargers of oil and grease, TDS and/or chloride to evaluate need for further action;
- annual reviews to identify changes that could affect plant performance and compliance;
- ongoing updates to the IUS; and
- re-evaluations and updates triggered by permit renewals and changes in environmental criteria at treatment facilities.

Table ES.1 summarizes control strategies in comparison to the City’s 2012 Code of Ordinances (City Ordinance).

<b>Table ES.1 Comparison of Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances</b>			
<b>Pollutant</b>	<b>2012 Code of Ordinances Limit (mg/L)</b>	<b>Code of Ordinance Limit (mg/L)</b>	<b>Applies to</b>
<b>Toxic Pollutants</b>			
Arsenic	-	0.035	SIUs
Boron	10.0	1.1	SIUs
Cadmium	0.10	0.028	SIUs
Chloride (1)	-	350	All Users
Chromium (2)	0.5	User-Specific	Selected IUs & SIUs
Copper	10.0	5.0	SIUs
Cyanide	2.0	0.78	SIUs
Fluoride	0.5	11	SIUs
Lead	-	0.74	SIUs
Mercury	0.05	0.0080	SIUs
Nickel	-	User-Specific	Selected IUs and SIUs
Selenium	0.10	0.0074	SIUs
TDS (1)	-	1800	All Users

**Table ES.1 Comparison of Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances**

<b>Pollutant</b>	<b>2012 Code of Ordinances Limit (mg/L)</b>	<b>Code of Ordinance Limit (mg/L)</b>	<b>Applies to</b>
Zinc	50.0	<b>166</b>	SIUs
<b>Conventional Pollutants</b>			
BOD	300	User-Specific (3)	Selected IUs and SIUs
TSS	-	User-Specific (3)	Selected IUs and SIUs
TKN	-	User-Specific (3)	Selected IUs and SIUs
Oil and Grease		(3)	All Users

*Notes: (1) The values shown are threshold values. Users who exceed these threshold values may be required to implement controls. (2) The City Ordinance limit in effect at the time of this study applies to hexavalent chromium; user-specific limit applies to total chromium. (3) The City Ordinance also prohibits discharges of pollutants in amounts that will cause interference or passthrough and gives the Director the discretion to issue permits and/or require users to implement BMPs.*

# Section 1 Introduction

This report documents the technical development of local limits for two of four wastewater treatment/water reclamation facilities owned and operated by the City of Buckeye, Arizona (City): Central Buckeye Wastewater Treatment Plant (WWTP) and Sundance Water Reclamation Facility (WRF).

This section summarizes the project background and purpose, describes the City's wastewater collection and treatment systems and their users, summarizes local limits sampling events and analyses, and introduces the report organization.

## 1.1 Project Background

Under the National Pretreatment Program (40 Code of Federal Regulations [CFR] Part 403.8), any publicly owned treatment works (POTW), or combination of POTWs operated by the same authority, with a total design capacity exceeding 5 million gallons per day (MGD) must establish a pretreatment program if it receives from industrial users (IUs) pollutants which may pass through or interfere with the operation of the POTW or are otherwise subject to federal pretreatment standards. These local programs enforce national pretreatment standards and any more stringent local requirements necessary to protect site-specific conditions. The total combined average annual daily flow capacity of the City's facilities exceeds 5 MGD, triggering the requirement for the City to establish a pretreatment program, including the development and enforcement of technically based local industrial pretreatment limitations (local limits).

The most recent Arizona Pollutant Discharge Elimination System (AZPDES) permit for Sundance WRF, issued to the City by the ADEQ on February 11, 2019, places the responsibility on the City, as Control Authority, for all pretreatment requirements in 40 CFR Part 403. Under Part V, Special Conditions, B, Pretreatment Conditions, the City must

- implement necessary legal authorities - 40 CFR Part 403.8(f)(1),
- enforce pretreatment requirements - 40 CFR Part 403.5 and 403.6),
- implement programmatic functions - 40 CFR Part 403.8(f)(2) and
- provide requisite funding and personnel to implement the pretreatment program - 40 CFR Part 403.8(f)(3).

The development and approval standards set by the U.S. Environmental Protection Agency (USEPA) and used by ADEQ to review the pretreatment program requires written descriptions of nine program elements, including local limits. The description of local limits must address the technical basis for local limits, including analyses necessary to determine the maximum allowable headworks loadings (MAHLs) as well as the method of allocating loadings to the users, a schedule of public hearings and outreach, and the ordinance adoption procedures.

The City Ordinance effective at the time of this study (published 2012) contained the following limits:

- Instantaneous limits for BOD, COD not defined elsewhere, oil and grease, suspended solids (SS), benzene, chloroform, ethylbenzene, toluene, xylenes, polyaromatic hydrocarbons, and phenols (Section 16-6-1, Prohibited Substances);
- Prohibition of tetrachloroethylene, specific pesticides, and pesticides in general (Section 16-6-1, Prohibited Substances);
- Daily average effluent limitations applicable to all users for arsenic, barium, boron, cadmium, chromium (VI and total), cyanide (amenable to chlorination and total), dissolved sulfides,

lead manganese, mercury, oil and grease (EPA Methods 413.1 and 418.1), selenium, silver and zinc (Section 16-8-2, Specific Industrial Requirements).

The provenance of these limits is unknown.

## 1.2 Project Purpose

Most POTWs are designed to remove domestic pollutants—organics and solids and possibly nutrients generated through residential-type uses of water. Removal of other pollutants, like heavy metals and toxic organic compounds, is incidental. Exceeding the POTW's ability to receive these non-domestic pollutants may result in various adverse effects, including permit violations with attendant fines or other enforcement actions, diminished value of or reduced disposal options for effluent and sludge, collection system issues and process upsets (interference), and harm to collection and treatment system workers.

Local limits play a key role in implementing the federal and state Pretreatment Programs. Through the local limit development process, general prohibited discharge standards (40 CFR 403.5(a)) and specific discharge standards (40 CFR 403.5(b)) are translated into site-specific controls. Local limits complement, and may be stricter than, federal categorical standards, which provide uniform national control of certain industries. Unlike federal categorical standards, local limits may apply to non-categorical industrial users and commercial users as well as categorical users, can regulate any pollutant, and are technically based on site-specific factors.

Regulations establish rigorous requirements for local limit development. POTWs must use best science to develop limits that are protective of the environment, technically based and technically valid, and must provide all interested parties with the opportunity to comment. Local limits in Arizona must be approved by ADEQ.

The general prohibited discharge standards mandate control of discharges to the POTW that could result in pass through or interference. Pass through occurs when a discharge enters receiving waters (e.g., a river, stream, wash, or aquifer) causing a violation of effluent limitations (e.g., AZPDES permit or Aquifer Protection Permit limits) or increases the magnitude or duration of such a violation. Interference occurs when a discharge enters the POTW (either the collection system or the treatment facility) that inhibits, disrupts, or prevents POTW processes or operations, sludge processes, or sludge use or disposal. Interference also includes collection system issues such as blockages resulting from accumulation of oil and grease and access limitations resulting from unsafe levels of explosive, flammable, or toxic gases.

Local limits are typically developed to control discharges from significant industrial users (SIUs). An SIU is defined as (USEPA Office of Wastewater Management/Permits Division, 2007)

1. an industrial user subject to categorical pretreatment standards or
2. an industrial user that
  - a. discharges an average of 25,000 gallons per day (gpd) or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater),
  - b. contributes a process waste stream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant, or
  - c. is designated as such by the city on the basis that it has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.

Under 2.c, the city may control discharges from commercial and institutional users through numeric local limits; and/or establish other requirements for these users. For example, the city may require certain groups of users (restaurants, auto shops, and truck stops) to install, maintain, and allow

inspection of interceptors should the city determine that these users may cause or contribute to blockages in the collection system.

The purpose of this project is to define, characterize, and reduce the potential threats posed by non-domestic discharges to the City's collection system and WRFs through development of local limits and update of relevant sections of the City Ordinance.

## **1.3 Wastewater Treatment and Collection System**

The wastewater treatment and water reclamation facilities owned and operated by the city include Central Buckeye WWTP, Sundance WRF, Festival Ranch WRF, and Tartesso WRF, which together treat over 3 MGD of wastewater. Future facilities are anticipated to be constructed as the City grows.

The sewer system consists of over 270 miles of sewer lines, more than 6,400 manholes, and three lift stations. There are approximately 23,000 sewer connections. There are also multiple areas and individual residences and businesses that use septic systems.

### **1.3.1 Central Buckeye WWTP**

Central Buckeye WWTP, located in Buckeye on Norton Drive, one mile south of City Hall, serves the south-central portion of the City. Its customers include residential, commercial, and industrial users. The WWTP has an annual average design capacity of 4.5 MGD. Estimated annual average influent flow is 1.55 MGD, based on data from April 2018 through March 2019. Liquid stream treatment works include screening and grit removal units, aeration basins and secondary clarifiers, disk filters, and chlorine contact basins. Since originally constructed, the WWTP has undergone several expansions.

The WWTP utilizes an advanced activated sludge process, the Bardenpho process, to provide secondary treatment. The process removes organic material (expressed as five-day biochemical oxygen demand, or BOD) and solids (expressed as total suspended solids, or TSS) well as nitrogen (nitrification/denitrification).

Effluent from Central Buckeye WWTP undergoes filtration, chlorination, and dechlorination prior to discharge to one of three outfalls: Outfall 002, a lateral of Buckeye Canal; Outfall 003, Roosevelt Canal; and Outfall 004, Buckeye Canal, tributary to the Arlington Canal. The Arlington Canal is tributary to the Middle Gila River.

Solids treatment works include belt filter presses. Dewatered sludge is landfilled.

Review of planning documents and discussions with City staff indicated that portions of the Central Buckeye service area are slated for immediate industrial development.

### **1.3.2 Sundance WRF**

Sundance WRF, located in the Sundance community near Dean Road and the Roosevelt Irrigation District (RID) Canal, serves the east portion of the City. Its customers include residential, commercial, and industrial users. The WWTP has an annual average design capacity of 3.47 MGD. Estimated annual average influent flow is 1.34 MGD, based on data from April 2018 through March 2019. Liquid stream treatment works include and influent pump station and headworks, anoxic reactors, sequencing batch reactors (SBRs), tertiary filters, ultraviolet (UV) disinfection facilities, and an effluent pump station. Since originally constructed, the WRF has been expanded.

The WWTP utilizes activated sludge biological treatment to provide secondary treatment. The process provides removal of BOD and SS as well as nitrification/denitrification.

Effluent from Sundance WRF undergoes filtration and UV disinfection prior to reuse or discharge to the RID underground storage facility via canal. Reclaimed water from the WRF may be used to irrigate a local golf course, under an agreement with Stewart Title Trust No. 2936 (Town of Buckeye, February 2003). Excess effluent is discharged to one of two outfalls: Outfall 001, Buckeye Irrigation District (BID) Canals; and Outfall 002, RID Canals tributary to the Hassayampa River, under an agreement with RID (Roosevelt Irrigation District, June 2016). Reclaimed water is also used to irrigate local school grounds (Buckeye School Districts, September 2015).

Solids treatment works include aerobic digesters, a rotary drum thickener, and screw presses. Dewatered sludge is landfilled.

A pipeline delivers reclaimed water from Central Buckeye WWTP to Sundance WRF. The system allows discharge of up to 1000 gallons per minute (gpm) of reclaimed water from Central Buckeye WWTP to the Buckeye and RID Canals.

Review of planning documents and discussions with City staff indicated that portions of the Sundance service area are slated for immediate industrial development.

### **1.3.3 Festival Ranch and Tartesso WRFs**

Festival Ranch WRF serves the residential community of Festival Ranch. The WRF has an annual average design capacity of 1.0 MGD. Current estimated annual average influent flow (based on 2017 flow data) is 0.25 MGD. Liquid stream treatment works include screening and grit removal units, SBRs, filters, UV units, and an effluent pump station.

The WRF utilizes an activated sludge process for removal of BOD and total suspended solids (TSS) and for nitrification/denitrification.

Effluent undergoes filtration and UV disinfection prior to reuse for irrigation or discharge to Wagner Wash, an ephemeral wash. Effluent discharged for reuse may be chlorinated to maintain residual chlorine necessary to prevent bio-clogging of the distribution system (ADEQ, June 2004). Reclaimed water from the WRF may be used to irrigate local golf courses and to replenish related irrigation and effluent-only lakes, under an agreement with Pulte Homes (Festival Ranch Reclaimed Water Master Plan, revised January 3, 2005). Excess effluent discharged to the ephemeral wash adjacent to the WRF may be periodic small-volume and/or of short duration, not to exceed a monthly average flow of 250,000 gpd, primarily during the winter months (ADEQ, August 2015).

Solids treatment works include aerobic digesters and belt filter presses. Dewatered sludge is landfilled.

Tartesso WRF serves the residential community of Tartesso. The WRF has an annual average design capacity of 1.2 MGD. Current estimated average influent flow (based on 2017 flow data) is 0.25 MGD. Liquid stream treatment works include screening and grit removal units, SBRs, filters, and UV disinfection units. The WRF is equipped with chemical feed facilities to add coagulants or polymers to the filtered effluent in the event of elevated turbidity.

The WRF utilizes an activated sludge process for removal of BOD and TSS and for nitrification/denitrification.

Effluent is recharged to two percolation basins for reuse. The WRF's AZPDES permit was obtained to allow temporary discharge to an ephemeral stream tributary of the Hassayampa River in the event of an emergency or under wet weather conditions. No outfall structure is in place or planned at this time. The two existing percolation basins provide sufficient capacity for current flows during

emergencies and under wet weather conditions. As the service area is developed the City will construct additional basins in 1.2 million gallon increments.

Solids treatment works include an aerated sludge storage tank and dewatering centrifuges. Sludge is hauled off site.

Review of planning documents and discussions with City staff indicated that the Festival Ranch and Tartesso service areas are currently non-industrial, and no industrial development is anticipated. The WRFs were included in the local limits study in response to past exceedances of effluent permit limitations.

## 1.4 Industrial Users

USEPA Guidance defines an industrial user as a non-domestic source of pollutants into a POTW regulated under Section 307(b), (c) or (d) of the Clean Water Act. Significant Industrial Users (SIUs), as defined in 40 CFR 403.3, include

- all users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR chapter I, subchapter N, referred to as Categorical Industrial Users (CIUs),
- industrial users that discharge an average of 25,000 gallons per day (gpd) or more of process wastewater to a POTW (excluding sanitary, non-contact cooling, and boiler blowdown wastewater),
- industrial users that contribute a process waste stream that makes up five percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant, and
- industrial users that are designated as such by the Control Authority (i.e., the City) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.

The City Ordinance, Section 16-11-2, classifies industrial users by the type of permit the Director is authorized to issue:

- Class I Permits, for SIUs.
- Class II Permits, for high strength users who are not otherwise required to obtain a permit. A high strength user is one whose discharge equals or exceeds 2.5 percent of the loading capacity (by mass) of either BOD or TSS or TKN irrespective of the actual discharge volume.
- Class III Permits, for zero process SIUs or to users meeting the definition of non-significant CIUs (NSCIU).
- Class IV Permits, for users that are more appropriately controlled under a general permit than under individual wastewater discharge permits. This class may include groups of commercial users, such as restaurants, that typically require pretreatment (such as oil and grease interceptors) and/or implementation of best management practices (BMPs).

In development of local limits, wastewater sources are typically divided into two groups: controlled and uncontrolled. Controlled sources are those to which local limits will apply, and generally include SIUs and other industrial users that are expected to discharge concentrations of one or more pollutants at levels exceeding those of typical domestic waste. Local limits do not apply to uncontrolled sources, which generally include residential, most commercial and institutional users, and some industrial users.

In 2018, the City initiated an Industrial User Survey (IUS) to identify potential SIUs and to refine its understanding of the non-domestic wastewater discharges to its treatment facilities. Water records

provided for three fiscal years (2014/2015, 2016/2017, and 2017/2018). The 2017/2018 records were reviewed in closer detail. High-volume users identified were municipal facilities, golf courses, and WalMart Distribution Center. No non-domestic wastewater dischargers met the flow criterion for SIUs, based on a monthly trigger level of 500,000 gallons per month, equivalent to 20 days of discharging 25,000 gpd.

A list of 165 non-domestic users of interest was provided to the City to include in the IUS. Introduction letters were issued by the City to these users. Surveys were initiated on December 5, 2018. To date, no SIUs have been identified within the City limits, including non-sewered areas.

## **1.5 Local Limits Sampling and Analysis**

EPA guidelines for initial local limits development were used as the basis for sampling analysis (See Table 4.1, USEPA, 2004). The guidelines recommend at least seven consecutive days of influent, effluent and residential/collection system sampling for facilities up to 5 MGD, two days of sludge sampling for percent solids, and 1 day of sampling for TCLP pollutants. To allow calculations of mass balances, sludge samples were analyzed for dry pollutant concentrations.

EPA guidelines recommend that at least two sampling points be included within each service area. Service area sampling locations were chosen as representative of the service area. Factors considered in selecting residential locations included residential density, age of housing, potable water supply, and sufficient wastewater flow. Similar factors were considered in selecting non-residential areas: density, age, water supply, and sufficient wastewater flow, as well as the diversity and representativeness of user types. Locations were chosen based on discussions with City staff who are long-time residents. Residential sampling locations were sited in areas where residences are occupied year-round. Commercial locations were chosen for concentration and variety of businesses, in areas with few residencies. The Sundance collection system location accounted for nearly a third of the businesses in the Sundance service area.

An evaluation of historical data showed that heavier influent BOD loadings are typically observed in late winter through early spring. Sampling was conducted in late March and early April to assess facility performance under these conditions.

Samples were analyzed in accordance with the standard procedures described in the Sampling and Analysis Plan. All sampling and analysis were conducted in accordance with 40 CFR Parts 136 and 503 approved methods. Analyses were conducted by Legend Technical Services. The laboratory is certified by the Arizona Department of Health Services. Sampling results are summarized for Central Buckeye WWTP in Appendix CB A-1, and for Sundance WRF in Appendix SD A-1.

### **1.5.1 Central Buckeye WWTP**

Historical data provided by the City included the results of routine process and regulatory monitoring of influent and effluent wastewater conducted in January 2016 and April 2018 and of biosolids in January 2016.

A preliminary evaluation of the available data for Central Buckeye WWTP identified the following national pollutants of concern (POCs) as site-specific POCs: arsenic, copper, selenium, BOD, TSS, and nitrogen. Boron, total dissolved solids (TDS), and oil and grease were also identified as site-specific POCs.

Sampling recommendations were submitted to and reviewed by ADEQ. The City conducted an intensive sampling program at Central Buckeye WWTP and in the collection system of its service area beginning March 19 and ending March 31, 2019. The sampling event included collection of

- WWTP influent and effluent: eight daily composite samples of each stream. Influent samples were time-composited. Effluent samples were flow-composited and collection lagged 12 hours past influent sample collection to account for detention time.
- Side stream: seven daily grab samples of the belt-press dewatering stream that is returned to, and combined with, the influent prior to the influent sampling location.
- Collection system waste stream: eight and nine daily flow-composite samples respectively, at two collection system locations—one residential and one mixed commercial:
  - Manhole on a 10-inch residential sewer main, serving 320 single-family dwellings. The manhole is located at 257<sup>th</sup> Lane and West St. Catherine Avenue. Sampling was moved to South 3rd Street and Monroe Ave after 2 to 3 days at the noted location because of high flows at the initial location.
  - Manhole on a 6-inch mixed sewer main, serving 7 restaurants, 3 churches, 3 auto repair shops, 1 barber, and 5 other offices. The manhole is located at the intersection of East Butler Avenue and North 3<sup>rd</sup> Street.
- Biosolids: three grab samples of dewatered sludge.

### 1.5.2 Sundance WRF

Historical data provided by the City included the results of routine process and regulatory monitoring of influent and effluent wastewater conducted in August 2017 and April 2018, and of biosolids in January 2016.

A preliminary evaluation of the available data for Sundance WRF identified the following national POCs as site-specific POCs: arsenic, chromium, BOD, TSS, and nitrogen. Boron, chloroform, and fluoride were also identified as site-specific POCs.

Sampling recommendations were submitted to and reviewed by ADEQ. The City conducted an intensive sampling program at Sundance WRF and in the collection system of its service area beginning April 11 and ending April 24, 2019. The sampling event included collection of:

- WWTP influent and effluent: eight daily time-composite samples of WRF influent and eight daily flow-composite samples of WRF effluent. Effluent sample collection lagged 6 hours past influent sample collection to account for detention time.
- Collection system waste stream: ten and eight daily composite samples respectively, at two collection system locations—one residential and one mixed commercial:
  - Manhole on a 6-inch residential sewer main, serving 360 single-family dwellings. The manhole is in a cul-de-sac at the intersection of South 226<sup>th</sup> Drive and West Twilight Trail. Residential samples were flow-composited.
  - Manhole on an 8-inch mixed sewer main, serving 10 restaurants, 1 hair salon, and 11 other mixed businesses. The manhole is in the driveway located at Watson Road and Yuma Road in Sundance Center between Auto Zone and Panda Express. Commercial samples were time-composited because of periodic low flows in the sewer main.
- Biosolids: one grab samples of dewatered sludge.

## 1.6 Project Methodology

Technical guidance for the Local Limits Study was obtained from state and federal resources, including

- The Pretreatment Program Procedures and Guidance Manual (ADEQ, 2004),
- Local Limits Development Guidance (USEPA, 2004) and
- EPA Model Pretreatment Ordinance (USEPA Office of Wastewater Management/Permits Division, 2007)

## 1.7 Report Organization

This report is organized as follows.

- Section 1, Introduction
- Section 2, Identification of Pollutants of Concern
- Section 3, Flow and Load Analyses
- Section 4, Removal Efficiencies
- Section 5, Maximum Allowable Headworks Loading (MAHL) Analyses
- Section 6, Control Strategies
- Section 7, Implementation of Local Limits
- Section 8, Works Cited

Facility-specific appendix tables are identified as “CB” (Central Buckeye WWTP) and “SD” (Sundance).

## Section 2 Identification of Pollutants of Concern

### 2.1 Introduction

A pollutant of concern (POC) is any pollutant that might reasonably be expected to be discharged in amounts that would cause or contribute to pass-through or interference (See Section 1.2), or otherwise create adverse conditions at City POTW. The USEPA considers 15 pollutants to be of national concern. The agency's reasons for this designation and the specific pollutants associated with each concern are

- widespread occurrence: cadmium, chromium, copper, lead, mercury, nickel and zinc
- high toxicity to microbes or aquatic life: arsenic, silver, and cyanide
- federal biosolids regulations: molybdenum and selenium
- excessive loading problems: BOD, TSS, and ammonia.

POTWs must also evaluate the site-specific circumstances of their POTWs and service areas to determine if other pollutants pose potential threats to their collection and treatment facilities. This evaluation considers effluent and sludge quality objectives, areas of vulnerability, and types and severity of potential problems.

USEPA recommends that each POTW screen for the presence of the 15 national POCs using data on industrial user discharges and collected from samples of POTW influent, effluent and sludge. At the time of this study there were no industrial users potentially subject to local limits identified in any of the four service areas. Historical data were reviewed and used in the identification and screening processes.

Identification of POCs is a two-step process. First, potential POCs are identified by reviewing relevant permits and regulations to determine applicable environmental criteria, and by interviewing City staff regarding WWTP upsets and collection system problems. Second, POTW monitoring data are compiled and compared to the environmental criteria to narrow the set of POCs to those with a greater potential to adversely affect the POTW.

Once potential POCs are identified and screened, preliminary MAHL analyses are conducted to determine which pollutants should be carried forward to development of local limits. Influent loads are calculated using historical data, and MAHLs are estimated using applicable environmental criteria (i.e., effluent permit limitations, water quality standards, and inhibition threshold levels), biosolids/sludge quality criteria and literature values for removal efficiencies. Ratios of influent loadings to MAHLs are compared to USEPA's suggested trigger levels for setting limits:

- greater than 60 percent for average loadings and
- greater than 80 percent for maximum loadings.

As noted in Section 1.3, review of planning documents and discussions with City staff indicated that portions of the Central Buckeye WWTP and Sundance WRF service areas are slated for immediate industrial development. The Festival Ranch and Tartesso service areas are currently non-industrial, and no industrial development is anticipated. Festival Ranch and Tartesso WRFs were included in the initial screening of potential POCs to confirm the non-industrial nature of their service areas, and in response to effluent limitation exceedances of ammonia, copper and zinc at Festival Ranch WRF.

Section 2 documents and summarizes the results of this process.

## 2.2 Potential Pollutants of Concern

### 2.2.1 Regulatory Review

Local limits are intended to protect end uses of effluents and biosolids. State environmental criteria, as expressed in water quality standards and regulated through permits, are the basis of calculation of local limits designed to protect State waters. End-use agreements with other parties may include additional user-specific requirements. Relevant permits and agreements discussed below include AZPDES permits, Aquifer Protection Permits (APPs), Reclaimed Water General Permit, and reuse agreements.

#### AZPDES Permits

Discharges of effluent from the City’s wastewater treatment facilities to waters of the State and disposal of biosolids are regulated by AZPDES permits issued by ADEQ. AZPDES permits include effluent limits based upon the State’s Water Quality Standards for Surface Water (SWQS).

AZPDES permits also require the City to collect and analyze representative samples of biosolids stockpiled or accumulated on-site prior to disposal and compare the analytical results to screening values equal to 20 times the toxicity characteristics leaching procedure (TCLP) limitations. If the total amount of a pollutant exceeds the screening value, then the leachable amount must be determined.

Table 2-1 lists AZPDES permits in effect for the City’s facilities.

Table 2.1. AZPDES Permits and APPs in Effect, City Facilities				
Location	Permit	Effective Date	Expiration Date	Notes
Central Buckeye WWTP	AZPDES No. AZ002513	3/27/2015	3/26/2020	Designated Uses: AgI, AgL
	APP P-100574	5/27/2016	-	-
Sundance WRF	AZPDES No. AZ0024881	2/11/2019	2/10/2024	Designated Uses: AgI, AgL
	APP P-105022	5/16/2016	-	-
Festival Ranch WRF	AZPDES No. AZ00025216	8/26/2015	8/25/2020	A&Wedw, PBC
	APP P-1005441	6/8/2004	-	-
Tartesso WRF	APZDES No. AZIF25127	7/23/2012	7/22/2017	-
	APP P-105340	12/24/2013	-	-

#### Central Buckeye WWTP

The designated uses of the receiving waters for Central Buckeye WWTP’s three outfalls include Agricultural Irrigation (AgI) and Agricultural Livestock Watering (AgL). The permit includes effluent limits for selenium and boron based on total maximum daily load (TMDL) analyses conducted on the Middle Gila River in 2015. There are currently no effluent limits for other metals or toxic organic compounds.

## Sundance WRF

The designated uses of the receiving waters for Sundance WRF's two outfalls include AgI and AgL. The permit includes effluent limits for boron and selenium based on total maximum daily load (TMDL) analyses conducted on the Middle Gila River in 2015. There are currently no effluent limits for other metals or toxic organic compounds.

## Festival Ranch WRF

The designated uses of the one outfall for Festival Ranch WRF are aquatic and wildlife, effluent-dependent waters (A&Wedw) and partial body contact (PBC). The permit contains two sets of effluent limits and monitoring requirements based on length and frequency of discharge:

1. The first set applies to discharges of seven or more consecutive days or with less than 30 days between discharges (Permit Tables 1.a and 2.a). It includes limits on ammonia, copper, cyanide, selenium, and zinc as well as BOD, TSS, and conventional parameters, and requires trace substance monitoring for chromium, hydrogen sulfide and sulfides, iron, mercury, and oil and grease.
2. The second set applies to discharges of less than 7 consecutive days with at least 30 days between discharges (Permit Tables 1.b and 2.b). It does not limit cyanide or selenium; otherwise limits are identical to those under the first set. Trace monitoring is reduced to chromium and oil and grease.

## Tartesso WRF

Effluent discharges from Tartesso WRF are regulated by AZPDES General Permit for Infrequent Discharges of Domestic Wastewater to Waters of the United States (ADEQ, February 2015). The permit includes effluent limits for BOD and TSS, along other conventional parameters. There are additional monitoring requirements for nitrogen, oil and grease, metals and trace substances, and selected toxic organic compounds. This permit expired on July 22, 2017 but has been administratively continued. If Tartesso WRF activates discharge, coverage will transition to an individual permit.

## APPs

Effluent discharges that ultimately reach the aquifer are regulated by APP permits issued by the ADEQ. APPs include discharge limits for heavy metals, toxic organic compounds, and nitrogen based on Arizona Aquifer Water Quality Standards (AWQS). The permits also include alert levels set at 80 percent of the discharge limits. Exceedance of an alert level triggers immediate investigation by the permittee. Table 2-1 lists APP permits in effect for the City's facilities.

## Reclaimed Water Permit and Agreements

Facilities are regulated by ADEQ under a Type 3 Agent Reclaimed Water General Permit, which holds the City responsible for the direct use of Class A+ reclaimed water by end users (ADEQ, April 2015).

The City holds reuse agreements with RID for discharge to the RID Canal System and with the Buckeye Union High School and Elementary School Districts for landscaping and school ground irrigation for Central Buckeye WWTP and Sundance WRF. For Festival Ranch, it holds reuse agreements with Stewart Title Trust for golf course irrigation, and with Pulte Homes for golf course irrigation and lake supply.

Although the City's formal agreements do not include specific user requirements for TDS, ADEQ and Arizona Department of Water Resources (ADWR) require that effluent used to recharge the aquifer not degrade the aquifer. In addition, the golf courses that use City effluent for turf irrigation require effluent of acceptable quality. TDS and sodium concentrations are of concern (Whitler, April 2018).

### 2.2.2 Other Considerations

In addition to protecting end uses of effluent and biosolids, local limits are designed to protect treatment plant and collection system workers, collection systems, and treatment works. Potentially adverse effects of wastewater discharges include

- fires and explosions,
- corrosive structural damage,
- obstruction of flow,
- inhibition of biological activity due to heat and
- formation of toxic gases, vapors, or fumes.

Lower explosive limits and closed cup flashpoints for potentially explosive or flammable compounds (from 2004 EPA Guidance, Appendix H) and exposure limits for compounds that can produce toxic fumes, gases or vapors (from 2004 EPA Guidance, Appendices I and J) were used as the basis for these evaluations.

The City's wastewater treatment facilities use biological processes for secondary treatment. These processes must also be protected from inhibitory constituents. Literature inhibition values (2004 EPA Guidance, Appendix G) were used in this evaluation.

The City Ordinance effective at the time of this study (published 2012) contained instantaneous limits, prohibitions, and daily average effluent limitations for specific pollutants, noted in Section 1.1.

City staff were asked to identify concerns based on their experience at the treatment facilities and in collection systems. Staff reported variability in flow volume and conventional pollutant loading at Sundance WRF.

Compliance history was assessed by a review of Discharge Monitoring Reports (DMRs) for the City's facilities from January 2017 through March 2020. The following AZPDES violations were recorded.

- Central Buckeye WWTP: one exceedance of the monthly average limit for selenium (second quarter of 2017) and three exceedances of minimum pH (August 2017 and April and May 2018).
- Sundance WRF: two violations of the minimum pH limit (July and August 2017).
- at Festival Ranch WRF:
  - 14 exceedances of the daily maximum limit for ammonia nitrogen (eight in 2017, three in 2018, one in 2019, and two in 2020), 13 of which resulted in exceedance of the monthly average.
  - Three exceedances of the daily maximum limit for copper, one of which resulted in exceedance of the monthly average limit (February 2018 and March, September and October 2018).
  - One exceedance of the monthly average limit for cyanide (July 2019).

- Five exceedances of the monthly average limit for zinc, each of which resulted in exceedance of the monthly average limit (February 2017, March 2018, September and October 2019).

The multiple exceedances of ammonia in 2017 at Festival Ranch WRF were traced to intrusion of Central Arizona Project water from the golf course. Whole effluent testing data from Festival WRF for Years 2016 through 2019 were reviewed. No incidents of toxicity were reported.

Tartesso WRF does not have infrastructure in place to discharge to the outfall regulated by its AZPDES permit and therefore does not file DMRs.

### 2.2.3 Methodology

Potential POTW-specific POCs were identified using a technical screening method described in USEPA guidance materials (USEPA, 1987). This method compares pollutant concentrations observed at the WWTP to environmental criteria for each potential POC as follows:

- the maximum influent concentration to the most stringent effluent criterion,
- the maximum effluent concentration to one-half the most stringent effluent criterion,
- the maximum influent concentration to one-half the inhibition threshold level of the most sensitive process,
- the maximum influent concentration to health and safety levels and
- the maximum biosolids concentration to biosolids criteria.

The following environmental criteria were used in these comparisons.

- Effluent criteria: AZPDES permit and APP limitations, Arizona SWQS, and Arizona AWQS. In addition, the federal maximum contaminant levels (MCLs) for arsenic and trihalomethanes that will eventually be incorporated into the state AWQS, were considered.
- Health and safety levels: values for lower explosive limits and closed cup flashpoints for potentially explosive or flammable compounds from 2004 EPA Guidance, Appendix H; exposure limits for compounds that may produce toxic fumes, gases or vapors from 2004 EPA Guidance, Appendices I and J.
- Process inhibition levels: literature inhibition values from 2004 EPA Guidance, Appendix G were used for most pollutants. Additional literature reviews were conducted for copper, nickel, and zinc.
- Biosolids criteria: TCLP limitations.

For toxic conservative pollutants exceeding the screening criteria, preliminary MAHL analyses were conducted using the methodology described in detail in Section 5. The purpose of the preliminary analyses was to identify pollutants with recent influent loadings approaching or exceeding the estimated capacity of the treatment facility. Historical data and literature values for removal efficiencies were used. Load-to-capacity ratios were calculated and pollutants with influent-to-MAHL ratios exceeding 80 percent were identified.

USEPA guidance materials (USEPA, 1987) suggest that the POTW collect a limited amount of screening data to determine which of these potential pollutants of concern should be subject to more extensive data collection through the local limits sampling program. The influent, effluent, and biosolids concentration data used in these analyses represent samples collected at the City's wastewater treatment facilities as part of process and compliance monitoring between January 2015

and February 2018. Additional limited sampling was conducted at Central Buckeye WWTP and Sundance WRF in April 2018 to fill data gaps.

Data used in these analyses included

### Central Buckeye WWTP

- Influent: weekly BOD and TSS concentration data; metals concentration data from samples collected in January 2016 and April 2018; and concentration data for toxic organics collected in April 2018.
- Effluent: BOD, TSS, and nitrogen concentration data from weekly and biweekly APP and AZPDES sampling; concentration data for toxic organics, metals, metalloids (boron and selenium), TDS, and oil and grease from quarterly and annual AZPDES sampling and from semi-annual and annual APP sampling.
- Biosolids: TCLP data from one sample collected in January 2016.

### Sundance WRF

- Influent: weekly BOD and TSS concentration data; toxic organics concentration data from one sample collected in August 2017; metals concentration data from two samples collected in April 2018.
- Effluent: BOD, TSS, and nitrogen concentration data from weekly and bi-weekly APP and AZPDES sampling; concentration data for toxic organics, metals, metalloids, TDS, and oil and grease from quarterly and annual AZPDES sampling and from semi-annual and annual APP sampling.
- Biosolids: TCLP data from one sample collected in January 2016.

### Festival Ranch and Tartesso WRFs

- Influent: weekly concentration data for BOD, TSS, and selected metals.
- Effluent: BOD, TSS, nitrogen, and selected metals concentration data from weekly compliance sampling; concentration data for toxic organics, metals, metalloids, and oil and grease from quarterly and annual AZPDES sampling and from semi-annual and annual APP sampling.

The potential of some pollutants to exceed permit limits, water quality standards, to inhibit biological treatment processes or to create health and safety issues could not be assessed because they were not analyzed in the influent or because method detection levels exceeded the most stringent criteria.

## 2.2.4 Results of Screening and Preliminary MAHL Analyses

This section summarizes and discusses the results of initial screening and preliminary MAHL analyses. Detailed results of identification of POCs are presented in Appendix B.

### Water Quality

Table 2.2 presents the results of the screening for toxic and conventional pollutants based on surface and aquifer water quality-based standards and effluent permits. The table summarizes the results of analyses detailed for Central Buckeye WWTP in Tables CB B-1 and B-2, for Sundance WRF in Tables SD B-1 and B-2, for Festival Ranch WRF in Table FR B-1, and for Tartesso WRF in Table T B-1.

Pollutants that qualified as potential site-specific POCs based on water quality at all facilities included arsenic, BOD, TSS and nitrogen.

Other pollutants that qualified as potential site-specific POCs based on water quality were

- boron, copper, selenium, and oil and grease at Central Buckeye WWTP;
- boron, chloroform, chromium, and fluoride at Sundance WRF;
- ammonia, copper, cyanide, fluoride, selenium, and zinc at Festival Ranch WRF; and
- fluoride at Tartesso WRF.

The national POCs and the potential site-specific POCs identified in Table 2.2 were carried forward to preliminary analysis with the following exceptions.

- Molybdenum and silver: there are no permit limits or other applicable environmental criteria upon which to base local limits.
- Chloroform: at Sundance WRF the qualifying concentration occurred when the UV system was not operational and chlorine was being applied as an alternate disinfectant.

Chloride and TDS were later added to the list of site-specific POCs based on comparisons of influent concentrations with informal water quality goals.

**Table 2.2. Summary of Potential Pollutants of Concern Based on Water Quality Criteria**

Pollutants	National Pollutant of Concern	Potential Site-Specific Pollutant of Concern (1)			
		Central Buckeye WWTP	Sundance WRF	Festival Ranch WRF	Tartesso WRF
<b>Toxic Pollutants</b>					
Ammonia	•			AZ,SW	
Arsenic	•	AWf	AWf	AWf	AWf
Boron		AZ,SW	AZ,SW		
Cadmium	•				
Chloroform			AW		
Chromium	•		AP,AW		
Copper	•	SW		AZ,SW	
Cyanide	•			AZ	
Fluoride			AP,AW	AP,AW	AP,AW
Lead	•				
Mercury	•				
Molybdenum	•				
Nickel	•				
Selenium	•	AZ,SW		AZ,SW	
Silver	•				
Zinc	•			AZ, SW	

**Table 2.2. Summary of Potential Pollutants of Concern Based on Water Quality Criteria**

Pollutants	National Pollutant of Concern	Potential Site-Specific Pollutant of Concern (1)			
		Central Buckeye WWTP	Sundance WRF	Festival Ranch WRF	Tartesso WRF
Conventional Pollutants					
BOD <sub>5</sub>	•	AZ	AZ	AZ	AZ
TSS	•	AZ	AZ	AZ	AZ
Nitrogen	•	AP,AZ	AP,AW	AP,AW,AZ,SW	AZ
Oil and Grease		AZ	(2)	AZ	(2)

Note: (1) Based on data collected between January 2016 and February 2018 and in April 2018. (2) Retained as a common cause of maintenance and operational problems.

Abbreviations:

AP = Aquifer Protection Permit limit, AW = Aquifer Water Quality Standard, AWf = future Aquifer Water Quality Standards, AZ = AZPDES Permit, SW = Surface Water Quality Standard

### Inhibition

Pollutants that qualified as site-specific based on literature-derived inhibition criteria at Central Buckeye WWTP and Sundance WRF included copper and zinc. Chloride and chromium also qualified at Sundance WRF. Table 2-3 summarizes influent data and inhibition criteria.

**Table 2.3. Site-Specific Pollutants of Concern based on Inhibition, Central Buckeye WWTP and Sundance WRF**

Location	Pollutant	Maximum Influent Concentration, mg/L	Literature-based Inhibition Criterion, mg/L
Central Buckeye WTP	Copper	0.944	0.05
	Zinc	1.37	0.3
Sundance WRF	Chloride	365	180
	Chromium	0.159	0.25
	Copper	0.226	0.05
	Zinc	0.83	0.3

Copper, chromium, and zinc were identified previously as site-specific POCs based on water quality. Chloride was added to the list of POCs for Sundance WRF.

### Biosolids/Sludge Quality

No pollutants qualified as site-specific based on biosolids/sludge quality criteria.

## Health and Safety

No pollutants qualified as site-specific based on health and safety criteria.

## Other Environmental Criteria, City Ordinance, and Compliance

As noted in Section 2.2.2, ammonia, copper and zinc were identified as potential site-specific POCs at Festival Ranch WRF through review of compliance reports.

## Preliminary MAHL Analyses

Influent loads and MAHLs for toxic pollutants (except ammonia) were estimated using historical data and removal efficiencies for activated sludge from literature reviews. The intentional oxidation and reduction of nitrogen compounds and nitrate in wastewater treatment facilities prevents use of this technique for ammonia.

Toxic pollutants with maximum load-to-influent ratios greater than 80 percent were

- Boron at Central Buckeye WWTP. Estimated ratios for other pollutants were 35 % or less.
- None at Sundance WRF. Estimated ratio for boron was 51 percent; for fluoride, 44 percent; and for arsenic, 40 percent. Ratios for other pollutants were 35 percent or less.
- Copper, fluoride, selenium, and zinc at Festival Ranch WRF.
- Fluoride at Tartesso WRF.

Based on these analyses and the City's stated intention to proceed with planned industrial development in these service areas, the following toxic and conventional pollutants were carried forward to development of MAHL-based local limits for both Central Buckeye WWTP and Sundance WRF.

### Toxic pollutants

- Arsenic
- Boron
- Cadmium
- Chloride
- Chromium
- Copper
- Cyanide
- Fluoride
- Lead
- Mercury
- Nickel
- Selenium
- Total dissolved solids
- Zinc

### Conventional pollutants

- BOD
- TSS
- Nitrogen compounds

Development of MAHL-based numeric limits requires SIU flow data and/or estimates of future SIU flow. Based on the absence of existing users to which local limits would apply and City formal plans to maintain the residential nature of these service areas, no further MAHL analyses were conducted for Festival Ranch and Tartesso WRFs.

The City will apply applicable City Ordinance provisions and implement other actions, including regular sampling, as detailed and summarized in Sections 6.2 through 6.6, to all facilities and their service areas, including the Festival Ranch and Tartesso service areas.

## Section 3 Flow and Load Analysis

### 3.1 Introduction

Analyses of POTW flows and load provide the basis for determining numeric local limits. In addition, they serve as the basis for influent and internal mass balances used to assess the accuracy of data and the reasonableness of assumptions.

The evaluations for Central Buckeye WWTP and Sundance WRF were based upon historical flow data from Years 2018-2019, upon flow data collected concurrently with the March and April 2019 sampling events, and upon pollutant concentration data collected from these facilities and their collection systems in March and April 2019.

### 3.2 Flow Analyses

Flow analyses focused on these waste streams:

- flow from service area sources,
- treatment/reclamation facility influent, effluent and return stream flow, and
- dewatered sludge production.

Service area sources were divided into two categories: residential and mixed commercial (there being no identified industrial sources). An evaluation of City water consumption data for the fiscal Year 2018 showed that residential sources consumed approximately 93 percent of water, and other nonindustrial sources, approximately 7 percent. Daily flow rate to each treatment/reclamation facility from each category of nonindustrial sources was estimated by multiplying the total influent by the appropriate factor.

For determining local limits, wastewater flow rates were estimated using daily flow records for May 2018 through April 2019 (Year 2018/19). For calculating mass balances, wastewater flow rates to Central Buckeye WWTP were estimated using daily effluent flow data for March 2019. Wastewater flow rates to Sundance WRF were estimated using daily influent flow data for April 2019.

At Sundance WRF, daily flow rate of the belt press return stream flow rate was estimated based on typical operation.

Daily production rate of dewatered sludge was determined using invoiced quantities for March 2019 (Central Buckeye WWTP) and for April 2019 (Sundance WRF).

Tables 3.1 and 3.2 summarize estimated service area and facility influent flow for Central Buckeye WWTP for Year 2018/19 and for March 2019, and for Sundance WRF for Year 2018/19 and for April 2019.

Table 3.1 Summary of Estimated Wastewater Flows (MGD) Central Buckeye WWTP		
Sector	Year 2018/19	March 2019
POTW Influent	1.55	1.45
Industrial	-	-
Residential	-	1.35
Mixed Commercial	-	0.10
Belt Press Return Stream	-	0.11

Table 3.2 Summary of Estimated Wastewater Flows (MGD), Sundance WRF		
Sector	Year 2018/19	April 2019
POTW Influent	1.34	1.63
Industrial	-	-
Residential	-	1.52
Mixed Commercial	-	0.11

### 3.3 Load Analyses

Load analyses are required to determine background loadings and removal efficiencies, necessary elements of the local limit calculations. They are also useful in evaluating the validity of assumptions and the accuracy of data through influent and facility mass balances. The sampling programs for Central Buckeye WWTP and Sundance WRF included estimation of

- service area loads contributed by residential and mixed commercial sources, and
- facility loads carried by influent, effluent, and return streams and by dewatered sludge.

Pollutant concentration data for site-specific POCs were collected from residential and mixed commercial sampling locations and from treatment/reclamation facility waste streams and dewatered sludge during the March and April 2019 sampling events described in Section 1.5.

Loads were determined using Equation 3-1:

Equation 3-1

$$L = 8.34 \times Q \times C$$

where

L = load, lb/d

8.34 = conversion factor  $\frac{\text{lb/MG}}{\text{mg/L}}$

Q = wastewater flow, MGD

C = pollutant concentration, mg/L

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*Note: lb/MG = pounds per million gallons  
mg/L = milligram per liter*

Average pollutant concentration values from the March and April 2019 sampling events were used to determine service area and facility loads. If all analytical concentration results for a pollutant in a given waste stream were reported as non-detected, zero was used as substitute value. If one or more results were reported as non-detected, the value of the method detection level was used as a substitute value for the result.

Appendix C includes

- summaries of service area, influent, side stream and effluent concentrations and loads (Tables CB C-1 and C-2 and SD C-1 and C-2),
- collection system-to-influent mass balances (Tables CB C-3 and SD C-3), and
- internal dry stream to wet stream mass balances (Tables CB C-4 and SD C-4).

# Section 4 Removal Efficiencies

## 4.1 Introduction

Removal efficiencies are key parameters in the equations used to calculate allowable headworks loads (AHL) for toxic pollutants. Removal efficiency is the fraction of the influent pollutant load removed across POTW (i.e., POTW influent to POTW effluent) or across a given process (e.g., POTW influent to primary effluent) and is expressed as a percentage (USEPA, 2004). Removal efficiency varies with the wastewater matrix, influent pollutant concentration, treatment technology, and POTW or process size, among other factors; thus, USEPA guidance strongly recommends collection of data for the characterization of site-specific removal efficiencies. Section 4.2 describes the methodology used to determine representative removal efficiencies and Section 4.3, the selection of representative values for each POC.

## 4.2 Methodology

Removal efficiencies for toxic POCs at Central Buckeye WWTP and Sundance WRF were calculated using pollutant concentration data collected in the March and April 2019 sampling events, respectively. Two types of removal efficiencies were calculated for each pollutant:

- The average daily removal efficiency (ADRE) was calculated by subtracting the effluent concentration from the influent concentration and dividing by the influent concentration for each set of paired data.
- The mean removal efficiency (MRE) was calculated by subtracting the average effluent concentration from the average influent concentration and dividing by the average influent concentration for the total data set.

The data set for each pollutant at each facility consisted of eight influent and eight effluent concentration values. Influent values reported as non-detected were excluded from calculation of average influent concentration, and daily removal efficiencies were not calculated. Detection level values were substituted in calculations for effluent values reported as non-detected.

In the absence of site-specific performance data for certain pollutants, two USEPA sources of process-specific removal efficiencies were consulted:

- The USEPA National Risk Management Research Laboratory (NRMRL) Treatability Data Base (USEPA, 2005) which provides information about the removal/destruction of pollutants from wastewater, among other media.
- Appendix R - Priority Pollutant Removal Efficiencies, Local Limits Development Guidance (USEPA, 2004), which provides median values from a database of removal efficiencies for 40 POTWs.

The NRMRL Treatability Data Base identifies influent pollutant concentration range, treatment technology, source matrix, and scale. For the purpose of this analysis, data sets were compiled from the following categories:

- Influent pollutant concentration range - The appropriate influent pollutant concentration range was selected based on the influent pollutant concentration observed in influent samples collected at City treatment facilities. For all pollutants except zinc, the range was 0 to 100 micrograms per liter (ug/L). Zinc concentrations ranged from 110 to 200 ug/L at Central Buckeye WWTP and from 120 to 140 ug/L at Sundance WRF.
- Treatment technology - biological nitrification/denitrification.

- Source matrix - domestic wastewater.
- Scale - full-scale (preferred), pilot-scale, and bench-top. With few exceptions, the data reported were for full-scale facilities.

The NRMRL database reports the average effluent pollutant concentration and removal efficiency for each facility or experiment. The number of facilities reporting for each POC varies from 11 to 78. For the purposes of this analysis, the median (the middle value of the set of removal efficiencies) and the average of the data set of removal efficiencies were calculated for each pollutant. Appendix R of the Local Limits Development Guidance reports the second decile, median, and eighth decile activated sludge removal efficiency values for the entire data set, comprising data from 4 to 26 POTWs (See USEPA, 2004 for a description of the decile calculation of removal efficiency).

### 4.3 Selection of Representative Removal Efficiency Values

Tables 4-1a and 4-1b summarize

- number of influent and effluent detected values,
- calculated removal efficiencies for Central Buckeye WWTP and Sundance WRF based on site-specific data collected during the March and April 2019 sampling events,
- average removal efficiencies from the NRMRL database (USEPA, 2005), and
- median removal efficiencies from Appendix R of the Local Limits Development Guidance (USEPA, 2004) for the toxic POCs.

Data supporting calculated removal efficiencies are summarized in Appendix Tables CB D-1 and D-2 for Central Buckeye WWTP and Tables SD D-1 and D-2 for Sundance WRF.

**Table 4.1 Summary of Calculated Removal Efficiencies at  
Central Buckeye WWTP and Literature-Based Removal Efficiencies**

<b>Pollutant</b>	<b>Site-Specific Removal Efficiencies March 2019</b>			<b>Literature-Based Removal Efficiencies</b>		<b>Selected Removal Efficiency</b>
	Detections (Influent/ Effluent)	Average Daily Removal Efficiency	Mean Removal Efficiency	NRMRL Treatability Data Base (2005) (1)	USEPA Guidance, Appendix R (2004) (2)	
Arsenic	3,0	9%	10%	50%	45%	10%
Boron	8,8	<0%	<0%	-	-	0%
Cadmium	7,1	58%	30%	62%	67%	30%
Chloride (3)	8,8	-	-	-	-	0%
Chromium	8,7	76%	76%	72%	82%	76%
Copper	7,0	49%	51%	72%	86%	51%
Cyanide	6,8	<0%	<0%	55%	69%	0%
Fluoride	8,8	59%	67%	-	-	67%
Lead	8,2	72%	73%	70 %	61%	73%
Mercury (4)	0,0	-	-	68%	60%	0%
Nickel	2,2	19%	29%	36%	42%	29%
Selenium	8,8	29%	29%	38%	50%	29%
TDS (3)	8,8	-	-	-	-	0%
Zinc	8,8	69%	70%	73%	79%	70%

NRMRL = National Risk Management Research Laboratory

Notes: (1) Average values (2) Median values (3) Negative removal efficiencies observed (4) Insufficient influent and/or effluent detections to calculate removal efficiency

Table 4.2 Summary of Calculated Removal Efficiencies at Sundance WRF and Literature-Based Removal Efficiencies						
Pollutant	Site-Specific Removal Efficiencies April 2019			Literature-Based Removal Efficiencies		Selected Removal Efficiency
	Detections (Influent/ Effluent)	Average Daily Removal Efficiency	Mean Removal Efficiency	NRMRL Treatability Data Base (2005) (1)	USEPA Guidance, Appendix R (2004) (2)	
Arsenic	6,6	5%	4%	50%	45%	0%
Boron	8,8	<0%	<0%	-	-	0%
Cadmium (3)	7,0	0%	0%	62%	67%	0%
Chloride (4)	8,8	-	-	-	-	0%
Chromium	8,8	75%	76%	72%	82%	76%
Copper	8,0	61%	61%	72%	86%	61%
Cyanide (3)	2,3	0%	0%	55%	69%	0%
Fluoride (4)	8,8	-	-	-	-	0%
Lead	8,0	66%	66%	70 %	61%	66%
Mercury	6,1	23%	19%	68%	60%	19%
Nickel	3,0	8%	8%	36%	42%	8%
Selenium	8,3	51%	52%	38%	50%	52%
TDS (4)	8,8	<0%	<0%	-	-	0%
Zinc	8,8	60%	61%	56%	79%	61%

NRMRL = National Risk Management Research Laboratory

Notes:(1) Average values (2) Median values (3) Insufficient influent and/or effluent detections to calculate removal efficiency (4) Negative removal efficiencies observed

Where site-specific removal efficiencies could be calculated and there were no mitigating factors, the MRE was selected as representative, as recommended by USEPA (USEPA, 2004). Exceptions included the following:

- For pollutants with one or more “negative” daily removal efficiencies, the removal efficiency was set at zero. At Central Buckeye WWTP, these were boron, chloride, cyanide, and TDS. At Sundance WRF, these were arsenic, boron, chloride, fluoride, and TDS.
- For pollutants with an insufficient number of detected values, the removal efficiency was set at zero. At Central Buckeye WWTP, the only instance was mercury. At Sundance WRF, these were cadmium and cyanide.

# Section 5 Maximum Allowable Headworks Loading (MAHL) Analyses

## 5.1 Introduction

Municipal WWTPs are typically designed to treat wastes produced by domestic uses such as personal hygiene, dishwashing, laundry, cleaning and maintenance. Conventional treatment processes oxidize organic matter (i.e., BOD), settle out solids (i.e., TSS), and convert nutrients (e.g., ammonia and other nitrogen compounds) to innocuous forms. These same processes may also remove non-domestic pollutants generated by industrial or commercial uses such as production, cleaning and other maintenance activities and poor management of on-site materials; or by other domestic uses, such as poor management of household chemicals. Removal of these pollutants is usually incidental. The ability of a WWTP to treat heavy metals and other non-conventional inorganic and organic pollutants is the basis of the maximum allowable headworks loading (MAHL) analysis method for developing local limits. The MAHL is the estimated maximum loading of a pollutant the POTW can receive without jeopardizing any criterion or otherwise causing pass through or interference.

Section 5 addresses MAHL analyses for Central Buckeye WWTP and Sundance WRF. The purpose of Section 5 is to

- describe the MAHL analysis method for toxic pollutants and how it specifically applies to City facilities (Section 5.2),
- discuss the results of the MAHL analyses for toxic pollutants (Section 5.3), and
- describe the MAHL analysis method and discuss the results of the MAHL analyses for conventional pollutants (Section 5.4).

Useful definitions are included in Appendix E-1.

## 5.2 MAHL Analyses of Toxic Pollutants–Method

The methodology used in the MAHL analyses for City facilities followed guidance provided by ADEQ (ADEQ, 2004) and USEPA (USEPA, 2004). The MAHL analysis method includes the following steps for each POC:

1. Determine relevant environmental criteria, flows, and removal efficiencies for heavy metals and toxic inorganic pollutants, as required by the AHL equations (Section 5.2.1).
2. Select appropriate AHL equations (Section 5.2.2).
3. Calculate the AHL for each set of relevant environmental criteria and select the MAHL from the AHLs (Section 5.2.3).

### 5.2.1 Determine Relevant Variables

#### Environmental Criteria

Water quality criteria used in these analyses were

- AZPDES monthly average concentration effluent limitations. Because the physical configuration of the two facilities allows commingling of effluent from both, the more stringent AZPDES permit limits at Sundance WRF for boron and selenium were also used for criteria at Central Buckeye WWTP. As noted in Section 2.2.1, these limits are based on TMDL analyses conducted on the Middle Gila River in 2015.

- APP alert levels.
- Current applicable AWQS and SWQS that apply to the designated uses of AgI and AgL for all POCs except arsenic. Because ADEQ has stated its intention to revise the current AWQS of 50 ug/L (micrograms per liter) to conform to the Federal MCL of 10 ug/L (ADEQ, 2008), the MCL of 10 ug/L was used.
- Informal effluent concentration goals for chloride and TDS of 350 and 1800 mg/L respectively to protect agricultural and landscape end uses of effluent for irrigation.

Biosolids criteria used in these analyses were the maximum pollutant concentrations for surface disposal of biosolids within 25 meters of the property line per 40 Code of Federal Regulations (CFR) Part 503.2 (Table CB E-4.3). These more stringent limits were used in lieu of TCLP limits associated with landfilling, as determination of AHLs based on TCLP requires collecting and comparing 10 to 12 data pairs of total pollutant concentrations in the sludge and TCLP concentrations.

Inhibition threshold values used in these analyses for all pollutants except copper, nickel, and zinc were literature values from USEPA (USEPA, 2004). An additional literature review was conducted for excepted pollutants (Barth E. F., 1965A) (Barth E. F., 1965B) (Braam, 1981) (Russell, 1982) (Trahern, 1982). The findings of the review are summarized in Appendix E-2.

## Flows

The AHL equations based on effluent quality criteria require an estimate of POTW influent flow to convert criteria expressed as concentrations into mass loadings. It is not advisable to use design flow capacity as the basis of MAHL analyses (unless the WWTP is at capacity) because it inflates the AHLs, risking pass through, interference, and over-allocations. These analyses used influent data collected in Year 2018/2019.

The AHL equations based on biosolids criteria require an estimate of mass sludge flow to disposal. The sludge flow for Central Buckeye WWTP was based on data from March 2019, and for Sundance WRF, on data from April 2019.

## Removal Efficiencies

The AHL equations require an estimate of POTW removal efficiency ( $R_{potw}$ ) for each POC to convert criteria-based loadings to AHLs. Influent and effluent data from the March and April 2019 sampling events at Central Buckeye WWTP and Sundance WRF were analyzed to determine representative removal efficiencies. In the absence of site-specific data, representative removal efficiencies were determined from an evaluation of literature sources. Section 4 detailed the results of the evaluation of removal efficiencies from these sources.

### 5.2.2 Select AHL Equations

AHLs are calculated using equations that express simple relationships based on the POTW's ability to remove a specific pollutant. The equations quantify the critical mass of pollutant allowed to be discharged to the environment; their solution depends upon the POTW's mass removal efficiency. They are specific to types of criteria (e.g., effluent water quality vs. sludge/biosolids). Variables include flow ( $Q$ ), removal efficiency ( $R$ ), and environmental criteria ( $C$ ). The specific equations for each set of environmental criteria are presented below.

## Effluent Quality Criteria

The AHL based on effluent quality criteria, including effluent permit limitations and aquifer and water quality standards, is calculated using Equation 5-1 (See Equation 5.5, 2004 EPA Guidance):

$$AHL_{eqc} = \frac{(8.34)(C_{eqc})(Q_{potw})}{1 - R_{potw}}$$

where

- AHL<sub>eqc</sub> = AHL based on effluent quality criterion (e.g., AZPDES permit limit), lb/d
- C<sub>eqc</sub> = Effluent quality criterion (e.g., AZPDES permit limit), mg/L
- Q<sub>potw</sub> = POTW average flow rate, MGD
- R<sub>potw</sub> = Plant removal efficiency from headworks to plant effluent, as decimal
- 8.34 = Conversion factor  $\frac{mg/L}{lb/d}$

## Sludge/Biosolids Quality Criteria

The AHL based on sludge/biosolids criteria is calculated using Equation 5-2 (See Equation 5-9, 2004 EPA Guidance):

$$AHL_{slg} = \frac{(8.34)(C_{slgstd})\left(\frac{PS}{100}\right)(Q_{slg})(G_{slg})}{R_{potw}}$$

where

- AHL<sub>slg</sub> = AHL based on sludge, lb/d
- C<sub>slg</sub> = Sludge standard, mg/kg dry sludge
- PS = Percent solids of sludge to disposal
- Q<sub>slg</sub> = Total sludge flow rate to disposal, MGD
- G<sub>slg</sub> = Specific gravity of sludge, kg/L
- R<sub>potw</sub> = Plant removal efficiency from headworks to plant effluent, as decimal
- 8.34 = Conversion factor  $\frac{mg/L}{lb/d}$

## Inhibition Threshold Levels

The AHL based on inhibition threshold levels, including inhibition levels for activated sludge and nitrification, is calculated using Equation 5-3 (See Equation 5.10, 2004 EPA Guidance):

$$AHL_{sec} = \frac{(8.34)(C_{inhib2})(Q_{potw})}{1 - R_{prim}}$$

where

- AHL<sub>sec</sub> = AHL based on secondary treatment inhibition, lb/d
- C<sub>inhib2</sub> = Inhibition criterion for secondary treatment, mg/L
- Q<sub>potw</sub> = POTW average flow rate, MGD
- R<sub>prim</sub> = Removal efficiency from headworks to primary treatment effluent, as decimal
- 8.34 = Conversion factor  $\frac{mg/L}{lb/d}$

Because there is no primary treatment at City facilities, the R<sub>prim</sub> effectively equals zero, and the equation reduces to Equation 5-4:

$$AHL_{sec} = (8.34)(C_{inhib2})(Q_{potw})$$

where factors are as defined above for Equation 5-3.

### 5.2.3 Calculate AHLs

Equations 5-1, 5-2, 5-3, and 5-4 were used to calculate AHLs for heavy metals and toxic inorganic compounds. The most stringent criterion for each POC from each set of relevant environmental criteria was used to generate an AHL. These sets were

1. Effluent quality, permits: APP and AZPDES permit limitations,
2. Effluent quality, standards: Arizona SWQS for designated uses of AgI and AgL and Arizona AWQS,
3. Sludge/biosolids quality: Federal biosolids limits for surface disposal of biosolids, and
4. Inhibition: Literature inhibition thresholds levels for activated sludge and nitrification.

## 5.3 MAHL Analyses of Toxic Pollutants - Results and Comparisons

This section presents and discusses results of the MAHL analyses of toxic pollutants for the Central Buckeye and Sundance facilities. It includes comparisons of influent loadings to MAHLs.

### 5.3.1 Results

Tables 5.1 and 5.2 summarize the results of MAHL analyses of toxic pollutants for Central Buckeye WWTP and Sundance WRF. Appendix E-3 presents an example of the MAHL calculations for arsenic, and Appendix E-4 presents detailed MAHL calculations for toxic pollutants.

Table 5.1 MAHL Summary for Toxic Pollutants, Central Buckeye WWTP (1)					
Pollutants	AHL lb/d based on:				MAHL lb/d
	Effluent Quality		Sludge/ Biosolids	Inhibition	
	Permit Limits	Water Quality Standards	Surface Disposal Limits (2)	Inhibition Threshold Levels (2)	
Arsenic	0.57	<b>0.14</b>	0.77	1.3	0.14
Boron	<b>13</b>	<b>13</b>	-	-	13
Cadmium	<b>0.074</b>	0.092	-	13	0.074
Chloride (3)	-	<b>4524</b>	-	2327	4524
Chromium	<b>4.3</b>	5.4	0.68	25	4.3
Copper	-	<b>13</b>	-	6.5	13
Cyanide	<b>2.1</b>	2.6	-	1.3	2.1
Fluoride	<b>125</b>	-	-	-	125
Lead	<b>1.9</b>	2.4	-	6.5	1.9
Mercury	<b>0.021</b>	0.026	-	1.3	0.021
Nickel	<b>1.5</b>	1.8	1.9	6.5	1.5
Selenium	0.05	<b>0.36</b>	-	-	0.05
TDS (4)	-	<b>23269</b>	-	-	23269
Zinc	-	<b>431</b>	-	21	431

Notes: (1) Bold values indicate controlling criterion. (2) Gray shading indicates controlling sludge/biosolids and inhibition criteria. These were not used to determine MAHL unless there were no Water Quality Permit or Standard criteria. (3) The MAHL for chloride was based upon the informal goal of 350 mg/L. (4) The MAHL for TDS was based upon the informal goal of 1800 mg/L.

Table 5.2 MAHL Summary for Toxic Pollutants, Sundance WRF (1)					
Pollutant	AHL lb/d based on:				MAHL lb/d
	Effluent Quality		Sludge/ Biosolids	Inhibition	
	Permit Limits	Water Quality Standards	Surface Disposal Limits (2)	Inhibition Threshold Levels (2)	
Arsenic	0.45	<b>0.11</b>	3.1	1.1	0.11
Boron	<b>11</b>	<b>11</b>	-	-	<b>11</b>
Cadmium	<b>0.045</b>	0.056	-	11.2	0.045
Chloride (3)	-	<b>3911</b>	-	2012	3911
Chromium	<b>3.7</b>	4.7	0.27	21	3.7
Copper	-	14	-	5.6	14
Cyanide	<b>1.8</b>	2.2	-	1.1	1.8
Fluoride	<b>36</b>	-	-	-	36
Lead	<b>1.3</b>	1.6	-	5.6	1.3
Mercury	<b>0.022</b>	0.028	-	1.1	0.022
Nickel	<b>1.0</b>	1.2	2/7	5.6	1.0
Selenium	0.070	<b>0.47</b>	-	-	0.070
TDS (4)	-	<b>20116</b>	-	-	20116
Zinc	-	<b>287</b>	-	17	287

Notes: (1) Bold values indicate controlling criterion. (2) Gray shading indicates controlling sludge/biosolids and inhibition criteria. These were not used to determine MAHL unless there were no Permit or Water Quality Standard criteria. (3) The MAHL for chloride was based upon the informal goal of 350 mg/L. (4) The MAHL for TDS was based upon the informal goal of 1800 mg/L.

The minimum AHL based on permit and water quality standard criteria was designated the MAHL. The minimum AHLs for copper, cyanide, and zinc at both facilities were based on activated sludge and/or nitrification inhibition threshold levels from the literature. It is recommended that the City correlate influent concentrations with process performance and identify and respond to signs of potential inhibition.

The minimum AHLs for chromium at both facilities were based on the biosolids limit. It is recommended that the City compare results of TCLP analyses to Federal limits for landfilling and identify and respond to signs of passthrough.

### 5.3.2 Comparison of Influent Loadings and MAHLs

To determine the need for new local limits, USEPA (USEPA, 2004) recommends considering the relationship between POTW influent loads and MAHLs. Influent loads that exceed the MAHL may jeopardize consistent compliance with permit limits and conditions or other environmental criteria.

For pollutants without existing local limits, USEPA suggests threshold levels for determining if limits are necessary. For a toxic pollutant, USEPA recommends that the Control Authority proceed with the development of a local limit if the average influent load is greater than 60 percent of the MAHL and/or the maximum influent load is greater than 80 percent of the MAHL. If the influent load-to-MAHL ratio is less than the threshold value, the POTW, at its discretion, may choose to halt the local limits development process.

Tables 5.3 and 5.4 summarize the results of the comparison of influent loads and MAHLs for toxic pollutants based on the March and April 2019 sampling results.

**Table 5.3 Comparison of Influent Loads and MAHLs for Toxic Pollutants Central Buckeye WWTP (March 2019)**

Pollutant	Estimated Influent Load lb/d		MAHL lb/d	Ratio of Influent Load to MAHL	
	Average	Maximum		Average	Maximum
Arsenic	0.058	0.067	0.14	41%	47%
<b>Boron</b>	<b>11</b>	<b>13</b>	<b>13</b>	<b>87%</b>	<b>100%</b>
Cadmium	0.0013	0.0039	0.074	2%	5%
<b>Chloride</b>	<b>8082</b>	<b>9967</b>	<b>4525</b>	<b>179%</b>	<b>220%</b>
Chromium	0.21	0.23	4.3	5%	5%
Copper	0.33	0.49	13	3%	4%
Cyanide	0.051	0.065	2.1	2%	3%
Fluoride	68	86	125	54%	68%
Lead	0.016	0.021	1.9	1%	1%
Mercury	0	0	0.021	0%	0%
Nickel	0.052	0.085	1.5	4%	6%
<b>Selenium</b>	<b>0.039</b>	<b>0.049</b>	<b>0.055</b>	<b>71%</b>	<b>90%</b>
<b>TDS</b>	<b>20113</b>	<b>25337</b>	<b>23269</b>	<b>86%</b>	<b>109%</b>
Zinc	2.1	2.6	431	0%	1%

*Note: Bold values indicate average influent load greater than 60% of MAHL and/or maximum load greater than 80% of MAHL.*

Table 5.4 Comparison of Influent Loads and MAHLs for Toxic Pollutants Sundance WRF (April 2019)					
Pollutants	Estimated Influent Load lb/d		MAHL lb/d	Ratio of Influent Load to MAHL	
	Average	Maximum		Average	Maximum
Arsenic	0.057	0.069	0.11	51%	62%
<b>Boron</b>	8.2	9.3	11.2	<b>73%</b>	<b>83%</b>
Cadmium	0.0011	0.0011	0.0	3%	3%
<b>Chloride</b>	3442	4347	3911	<b>88%</b>	<b>111%</b>
Chromium	0.27	0.32	3.7	7%	9%
Copper	0.49	0.61	14	3%	4%
Cyanide	0.034	0.034	1.8	2%	2%
Fluoride	20	23	36	57%	64%
Lead	0.010	0.012	1.3	1%	1%
Mercury	0.0011	0.0022	0.0	5%	10%
Nickel	0.044	0.054	1.0	4%	6%
Selenium	0.028	0.044	0.1	40%	62%
TDS	10170	13187	20116	51%	66%
Zinc	1.6	1.565	287	1%	1%

*Note: Bold values indicate average influent load greater than 60% of MAHL and/or maximum load greater than 80% of MAHL.*

Pollutants with influent loads exceeding EPA threshold levels were

- Boron and chloride at both facilities, and
- selenium and TDS at Central Buckeye WWTP.

Pollutants with moderately high influent loads were

- arsenic and fluoride at both facilities, and
- selenium and TDS at Sundance WRF.

Toxic pollutants are divided into two groups for discussion of results of MAHL analyses:

- Group A—arsenic, boron, chloride, fluoride, selenium and TDS, and
- Group B- cadmium, chromium, copper, cyanide, lead, mercury, nickel and zinc.

#### Group A: Arsenic, Boron, Chloride, Fluoride, Selenium and TDS

These pollutants, with moderate to high influent loadings at both facilities, are naturally occurring in groundwaters in Arizona. Fluoride is also added to drinking water by the City with a goal of maintaining concentrations of 0.7 to 1.0 parts per million according to the City’s website.

Table 5.5 presents a comparison of concentrations of selected pollutants in service area-specific drinking water samples and in samples of wastewater influent to Central Buckeye WWTP and Sundance WRF. The data show significant percentage increases in concentration with use for all pollutants at both treatment facilities.

Table 5.5 Comparison of Drinking Water and Influent Wastewater Concentrations				
Pollutant	Concentration mg/L			Increase
	Drinking Water	Influent Wastewater	Change	
<b>Central Buckeye WWTP</b>				
Boron	0.5	0.87	0.4	80%
Chloride	262	625	363	140%
Fluoride	1.6	5.3	3.7	240%
TDS	618	1556	938	150%
<b>Sundance WRF</b>				
Boron	<0.005	0.73	0.73	>14,000%
Chloride	15.7	308	292	1,900%
Fluoride	1.0	1.8	0.77	55%
TDS	283	910	627	220%

The concentrations of these pollutants in wastewater from nonindustrial sources can be attributed in part to their presence in drinking water and in part to the use of on-site water conditioning systems by residential and commercial users to reduce hardness and remove undesired constituents.

These constituents are poorly removed by conventional wastewater treatment processes. The influent loadings of boron, chloride, and TDS exceed EPA threshold levels (average exceeds 60% and/or maximum exceeds 80% of MAHL) at both Central Buckeye WWTP and Sundance WRF. Fluoride loading exceeded the threshold level at Sundance and is moderately high at Central Buckeye WRF.

The City's plans include development of a large water treatment facility that will include advanced processes to deliver high-quality water to customers. In addition to concentrating TDS, disposal of waste brine from advanced reclaimed water treatment processes to wastewater treatment facilities may significantly increase influent wastewater concentrations of these pollutants.

It is recommended that the City estimate the discharge loads of these pollutants from advanced water treatment facilities and reserve loading capacity accordingly.

These pollutants were retained for further analysis.

## Group B: Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel and Zinc

The observed influent loadings of these pollutants were less than 10 percent of MAHL; however, given the City's expectation that an industrial sector will develop and grow in each service area, they were also retained for further analysis.

## 5.4 MAHL Analysis Method and Results for Conventional Pollutants

This section describes the MAHL analysis method for conventional pollutants for the Central Buckeye and Sundance facilities and discusses the results of these analyses. Facility design criteria for nitrogen are expressed as TKN; therefore, MAHL analyses for nitrogen were performed based on TKN.

### 5.4.1 Results

MAHL analyses for conventional pollutants used facility design concentration criteria and influent flow data collected in Year 2018/2019. The design criteria for Central Buckeye WWTP and Sundance WRF are identical:

- BOD—300 mg/L
- TSS—300 mg/L
- TKN—40 mg/L

The AHL based on design criteria was calculated using Equation 5-5:

$$AHL_{des} = (8.34)(C_{des})(Q_{potw})$$

where

- AHL<sub>des</sub> = AHL based on design criteria, lb/d
- C<sub>des</sub> = POTW influent design concentration, mg/L
- Q<sub>potw</sub> = POTW average flow rate, MGD
- 8.34 = Conversion factor  $\frac{mg/L}{lb/d}$

Table 5.6 summarizes the results of the MAHL analyses of conventional pollutants for the Central Buckeye and Sundance facilities.

Table 5.6 MAHL Summary and Comparison of Influent Loads and MAHLs for Conventional Pollutants					
Pollutants	Influent Concentration mg/L	Influent Load lb/d	Design Concentration mg/L	MAHL lb/d	Ratio of Influent Load to MAHL
Central Buckeye WWTP (March 2019)					
<b>BOD</b>	295	3810	300	3878	<b>98%</b>
TSS	216	2793	300	3878	72%
<b>TKN</b>	72	933	40	517	<b>180%</b>
Sundance WRF (April 2019)					
<b>BOD</b>	322	3599	300	3353	<b>107%</b>
TSS	206	2302	300	3353	69%
<b>TKN</b>	69	771	40	447	<b>173%</b>

*Note: Bold values indicate average influent load greater than 80% of MAHL.*

#### 5.4.2 Comparison of Influent Loadings and MAHLs

For conventional pollutants, USEPA recommends an average influent load-to-MAHL threshold of 80 percent. Table 5.6 summarizes the results of the comparison of influent loads and MAHLs for conventional pollutants based on the March and April 2019 sampling results and Year 2018/2019 influent flows. BOD and TKN loads at both Buckeye facilities exceeded average design capacity.

All conventional pollutants were retained for further analysis.

# Section 6 Control Strategies

## 6.1 Introduction

Control strategies for meeting Federal and State Pretreatment Program requirements include MAHL-based local limits, Best Management Practices (BMPs), public education and awareness programs, surcharge programs, and/or prohibitions. A POTW can select any control strategy that is protective, enforceable, and reasonable. MAHL-based local limits were calculated to apply to controllable sources. Those users of the system classified as SIUs are issued permits by the City and regulated through industry sampling, periodic inspections, and reporting requirements. Other users of the system (commercial and non-SIU) are controlled through periodic inspections, application of Best Management Practices (BMPs), reporting, and in some cases the issuance of a non-SIU permit (See Section 16-11 of the City Ordinance).

Section 5 described the development of MAHLs for those pollutants amenable to the MAHL method for Central Buckeye WWTP and Sundance WRF. (As noted in Section 2.2.5, POCs were not carried forward for Festival Ranch and Tartesso WRFs.) It compared projected influent loads to MAHLs for these facilities and determined that the following POCs posed sufficient threat to treatment processes, receiving waters, and/or end uses to warrant development of limits: arsenic, boron, chloride, fluoride, selenium, and TDS. Although influent loads of the remaining POCs—cadmium, chromium, copper, lead, mercury, nickel, and zinc—did not exceed USEPA-recommended threshold levels, they were retained for further consideration in anticipation of future industrial growth.

The steps that constitute the development of MAHL-based limits for a given pollutant are:

1. Calculate the estimated maximum pollutant loading the POTW can receive without jeopardizing any criterion or otherwise causing pass through or interference (the MAHL), as documented in Section 5.
2. Calculate the estimated maximum pollutant loading that can be received at a POTW's headworks from all permitted IUs and other controlled sources without causing pass through or interference (the maximum allowable industrial loading, or MAIL). This step reserves a portion of the MAHL for variability and other uncertainties (safety factor), contributions from uncontrolled sources (background loading), growth (growth allowance), and hauled waste, if it is accepted at the POTW.
3. Consider appropriate control strategies for each pollutant.

Alternate control methods may be suitable for different pollutants and for various contributing sources. Numeric limits are appropriate controls for pollutant discharges that can be limited through industrial pretreatment or pollution prevention measures (like reduction, reuse, and recycle of process materials containing pollutants) and can be sampled and analyzed regularly to demonstrate compliance (such as waste streams from manufacturing processes). BMPs are useful for pollutant discharges that are fugitive or incidental (such as washdown containing petroleum products and heavy metals at vehicle service facilities, or VSFs), associated with domestic uses (such as use of dandruff shampoos containing selenium), and/or difficult to monitor (such as disposal of waste containing mercury from dental facilities). High-strength dischargers of conventional pollutants (e.g., BOD and TSS) like food processors can be controlled in a variety of ways such as imposing surcharges or requiring BMPs. City Ordinance Section 16-11-2C.2 gives the City the authority to issue a Class II permit to high-strength dischargers and to impose user-specific limits.

Section 6 describes the development of MAHL-based numeric limits for amenable POCs at Central Buckeye WWTP and Sundance WRF. It considers other control strategies applicable to all City service areas, including Festival Ranch and Tartesso WRFs. Section 6.2 addresses numeric limits and other control strategies for toxic pollutants, and Section 6.3, conventional pollutants and nutrients (BOD, TSS, and TKN). Section 6.4 addresses control strategies for oil and grease. Section 6.5 summarizes control strategies and Section 6.6 addresses sampling, reviews, re-evaluations and updates. Useful definitions are included in Appendix E-1.

## 6.2 Numeric Limits and Other Control Strategies: Toxic Pollutants

This section describes the development of local limits and other control strategies for toxic constituents. Numeric limits were calculated to apply to controllable sources. Section 6.2.1 describes MAIL analyses; Section 6.2.2, numeric limit calculations for Central Buckeye WRF and Sundance WWTP; and Section 6.2.3, alternate control strategies for all service areas.

### 6.2.1 MAIL Analyses

The MAIL is the estimated maximum loading of a pollutant that can be received at the POTW's headworks from controlled sources without causing pass through or interference. The MAIL is calculated using Equation 6-1 (See Equation 6.2, 2004 EPA Guidance):

$$MAIL = MAHL(1 - SF) - (L_{unc} + HW + GA)$$

where:

- MAIL = Maximum allowable industrial loading, lb/d
- MAHL = Maximum allowable headworks loading, lb/d
- SF = Safety factor, if desired, as decimal
- $L_{unc}$  = Loadings from uncontrolled sources, lb/d
- HW = Loadings from hauled waste, lb/d
- GA = Growth allowance, lb/d

Appropriate values for these factors for toxic pollutants were determined for Buckeye facilities as discussed below.

**Safety Factor.** The safety factor accounts for uncertainties that affect the accuracy of local limits calculations. These may include the amount, quality, and variability of the data the POTW used to develop MAHLs; the history of compliance with the parameter; and the number, size, and potential for slug loadings of each SIU. USEPA (USEPA, 2004) recommends setting a minimum safety factor of 10 percent.

**Uncontrolled Loading ( $L_{unc}$ ).** The uncontrolled loading is the total of loadings from all uncontrolled sources, including domestic, some or all commercial, and infiltration and inflow (I&I). The uncontrolled loading is calculated using Equation 6-2:

$$L_{unc} = (C_{unc})(Q_{unc})(8.34)$$

where

- $L_{unc}$  = Uncontrolled loading, lb/d
- $C_{unc}$  = Uncontrolled pollutant concentration, mg/L
- $Q_{unc}$  = Uncontrolled flow rate, MGD
- 8.34 = Conversion factor from mg/L to lb/d

For these analyses, the uncontrolled flow was determined as described in Section 3.2.

**Hauled Waste.** Hauled waste represents the loadings from haulers of domestic and/or commercial waste that are discharged to the POTW (either to the collection system or directly to the treatment works), if hauled waste is not regulated through local limits. The City does not accept hauled waste.

**Growth Allowance.** The growth allowance is a portion of the MAHL reserved for anticipated increases in loadings from new IUs, expansion of existing IUs, and/or new commercial or domestic development. As discussed in Section 3, no SIUs have been identified in either the Central Buckeye or Sundance service areas. To accommodate the industrial growth anticipated by the City, the influent flow rates on which MAHLs were based were increased to incorporate reserves for industrial discharges. This approach is conservative, as it does not depend upon increases in flow from uncontrolled sources with growth.

## 6.2.2 Numeric Limits

Numeric limits are appropriate controls for pollutant discharges that can be limited through industrial pretreatment or pollution prevention measures and can be sampled and analyzed regularly to demonstrate compliance. Numeric limits are typically applied to discharges from SIUs, who, because of the nature and size of their operations, can meet these conditions.

The following objectives framed the development of numeric limits for toxic pollutants:

1. To prepare for the level of industrial development anticipated for the Central Buckeye and Sundance service areas, as documented in the City's 2017 Master Plan
2. To develop a single set of uniform concentration limits protective of the Central Buckeye and Sundance treatment facilities and collection systems and achievable by industry standards
3. To develop user-specific limits in cases where the calculated uniform concentration limit is not technologically or economically achievable
4. To supplement numeric limits with other control mechanisms, where appropriate
5. Section 6.2.2.1 addresses uniform concentration limits, and 6.2.2.2, user-specific limits.

### 6.2.2.1 Uniform Concentration Limits

The uniform concentration method divides the MAIL among all controlled sources (i.e., SIUs). The MAIL is divided by the rate of flow from controlled sources, yielding the uniform concentration limit (UCL), as shown by Equation 6-3 (See Equation 6.8, 2004 EPA Guidance):

$$UCL = \frac{MAIL \times 1000}{Q_{cont} \times 8.34}$$

where

- UCL = Uniform concentration limit, mg/L
- MAIL = Maximum allowable industrial loading, lb/d
- $Q_{cont}$  = Controlled flow rate, MGD
- 8.34 = Conversion factor from lb/d to mg/L

At the time of this study, there were no controlled sources, and no sources identified as potentially controlled, in either the Central Buckeye or Sundance service areas. To be immediately protective and continue to remain effective with industrial growth, MAHL and MAIL calculations for determining UCLs assumed an increase in controlled discharges, with no increase in uncontrolled discharges,

until the proportions of flow from controlled and uncontrolled sources were consistent with the City's 2017 Master Plan.

Flow rates from controlled and uncontrolled sources for each service area were estimated using land use data provided by the City and water usage rates for specific land uses from the 2017 Integrated Water Master Plan (City of Buckeye, 2017), as follows:

1. Calculate total acreage designated for each land use category.
2. Estimate water usage for each land use category using Master Plan volume of water use per acre for each category.
3. Group land use categories into controlled ("industrial") and uncontrolled ("residential", "commercial/mixed use", "developed open space parks", and "open space").
4. Calculate controlled, uncontrolled, and total influent water usage.
5. Calculate the fraction of water used by controlled sources by dividing controlled water usage by total water usage. For Central Buckeye WWTP, the controlled fraction was 18 percent; for Sundance WRF, three percent.
6. Determine controlled, uncontrolled, and total influent flow rate for each service area using 2018-2019 facility flow data. Appendix F-1 contains calculations supporting the determination of flows.

This approach allowed calculation of UCLs that are immediately protective of the treatment facility and remain effective with service area growth as long as (1) uncontrolled source concentrations do not increase, (2) relative controlled source growth does not outpace uncontrolled source growth and (3) there are no changes in end uses or in environmental criteria associated with end uses.

For Central Buckeye WWTP, the controlled fraction was 18 percent; for Sundance WRF, three percent. The following example illustrates flow calculations for Central Buckeye WWTP, with current flow from uncontrolled sources of 1.55 MGD (April 2018-March 2019 average) of uncontrolled flow and a target controlled flow fraction of 18 percent:

$$Q_{wwtp} = Q_{unc} + Q_{con}$$

where

$Q_{wwtp}$  = Influent WWTP flow from all sources

$Q_{unc}$  = Flow from uncontrolled sources (residential, mixed commercial users, and other users to which local limits will not apply) = 1.55 MGD

$F_{con}$  = Target controlled flow fraction = 18%

$Q_{con}$  = Flow capacity available to controlled sources (industrial sources to which local limits will apply) =  $Q_{wwtp} \times F_{con}$

$$Q_{wwtp} = Q_{unc} + (F_{con} \times Q_{wwtp}) = Q_{unc} + (0.18 \times Q_{wwtp})$$

$$Q_{unc} = Q_{wwtp} - (0.18 \times Q_{wwtp}) = 0.82 \times Q_{wwtp}$$

$$Q_{wwtp} = 1.55 \text{ MGD} / 0.82 = 1.890 \text{ MGD}$$

$$Q_{con} = 0.18 \times 1.89 \text{ MGD} = 0.340 \text{ MGD}$$

MAHLs for Central Buckeye WWTP were calculated using a total influent flow rate of 1.89 MGD and a controlled flow rate of 0.340 MGD.

Initial MAHL calculations for Sundance WRF used an estimated SIU flow fraction of three percent, based on the analysis of 2017 Master Plan build-out land use and water usage projections. The controlled flow fraction was iteratively adjusted to reach a common set of UCLs protective of both facilities. This balance was achieved at flow fractions of 18 percent for Central Buckeye WWTP and 12 percent for Sundance WRF.

Table 6-1 summarizes the set of UCLs calculated for each facility and the common set protective of both. Appendix F-2 presents an example of the MAIL calculation for arsenic for Central Buckeye WRF. Appendix F-3 contains UCL calculations for Central Buckeye WWTP at a controlled flow fraction of 18 percent, and for Sundance WRF at controlled flow fractions of three and 12 percent.

Table 6.1 Uniform Concentration Limits (UCLs, mg/L), Toxic Pollutants of Concern			
Pollutant	Central Buckeye WWTP (1)	Sundance WRF (2)	Common (3)
<b>Toxic Pollutants</b>			
Arsenic	0.035	0.038	0.035
Boron	1.1	2.1	1.1
Cadmium	0.028	0.029	0.028
Chloride (4)	(5)	366	-
Chromium	1.6	2.3	1.6
Copper	5.0	9.3	5.0
Cyanide	0.78	1.2	0.78
Fluoride	24	11	11
Lead	0.74	0.88	0.74
Mercury	0.0080	0.014	0.0080
Nickel	0.55	0.62	0.55
Selenium	0.0074	0.029	0.0074
TDS	1912	6827	1912
Zinc	166	191	166
<i>Notes: (1) Based on uncontrolled flow of 1.55 MGD, controlled flow of 0.340 MGD. (2) Based on uncontrolled flow of 1.34 MGD, controlled flow of 0.182 MGD. (3) Common UCL protects both facilities. (4) Based on informal goal of 350 mg/L. (5) Based on informal goal of 1800 mg/L. (5) Uncontrolled load exceeded MAHL; UCL could not be calculated</i>			

A review of the calculated UCLs in light of experience with established area pretreatment programs determined that, for nickel and chromium, the user-specific allocation method may be more appropriate than the UCL method. The UCL for nickel may be difficult to achieve technically for metal

finishers whose use of electroless nickel baths is extensive. While the UCL for chromium is technically achievable, assigning large fractions of the MAIL based on flow to users with low chromium concentration discharges would consume capacity that could be more effectively allocated to users with higher chromium concentration discharges. The user-specific allocation method allows flexibility in setting numeric limits on each industrial user. Its application to chromium and nickel is discussed in Section 6.2.2.2.

As noted in Section 5, both Central Buckeye WWTP and Sundance WRF receive moderately high to high loads of boron, chloride, fluoride, and TDS. UCLs for boron, fluoride, and TDS were calculated for both Central Buckeye WWTP and Sundance WRF. A UCL for chloride was calculated for Sundance WRF but could not be calculated for Central Buckeye WWTP as uncontrolled loading exceeded the MAHL. Other control strategies can be used to achieve or support compliance for these pollutants. These strategies are discussed in Section 6.2.3.

#### 6.2.2.2 User-specific Limits

As noted above, review of the calculated UCLs determined that, for nickel and chromium, the user-specific allocation method may be more appropriate than the UCL method. This method allots portions of the MAIL to prospective controlled sources according to a user-specific evaluation of each proposed discharge. It creates a reserve into which capacity is contributed by users with low-concentration discharges and drawn upon by users with high-concentration discharges. The strategy consists of an initial evaluation, conducted at the planning and development stage, followed by a discharge load evaluation, allocation and permitting.

##### Initial Evaluation

An initial evaluation of each potential SIU is conducted as it moves through the planning and development stage. The evaluation is based on inquiry and analysis of prior requirements, treatability, and economic achievability.

- Prior requirements: Are there numerical criteria (e.g., concentration- or production-based categorical standards) or pretreatment requirements that will apply to the IU?
- Treatability: Are anticipated waste streams amenable to pretreatment (whether pretreatment is a prior requirement or not)? What is technically achievable? Is there an industry standard for pretreatment?
- Economic achievability

The findings are used to inform the decision to move forward or not (accept with no conditions; accept with conditions, such as pretreatment; or reject).

##### Discharge Load Evaluation, Allocation and Permitting

If the SIU is accepted, anticipated discharge loads from the SIU (with pretreatment, if a condition of acceptance) are estimated and compared to available treatment capacity. If the anticipated discharge load for a given pollutant is less than the flow-based POTW capacity available to it, the unused capacity is placed in a service area reserve. If the anticipated discharge load is greater than the flow-based capacity available to it, the additional capacity needed can be drawn from the reserve if (1) the reserve holds adequate capacity, and (2) the size of the allocation is acceptable. In either case, the SIU is issued a permit containing flow and concentration limits. Although a load allocation is possible, the determination of MAHLs is concentration-based, and reduced flow-through, for example, water conservation--and the consequent increase in concentration, could compromise

treatability. Implementation of the user-specific allocation method requires strict compliance with Baseline Monitoring Report (BMR) requirements. Appendix F-4.1 presents a simplified example of this method for nickel for Central Buckeye WWTP.

### 6.2.3 Other Control Strategies for Toxic Pollutants

Other control strategies can be used to achieve or support compliance for pollutants with high loads discharged by non-SIU sources in all City service areas. As noted in Section 5, City treatment facilities receive moderately high to high loads of boron, chloride, fluoride, and TDS. Given the absence of identified SIUs in any service area these loads may be attributed to the use of on-site water conditioning systems by residential, commercial, institutional, and non-SIU industrial users to which MAHL-based limits would not apply.

The City plans to develop a large water treatment facility delivering high-quality water to customers and potentially disposing of waste brine from advanced reclaimed water treatment processes to wastewater treatment facilities. These discharges may significantly increase influent wastewater concentrations of these pollutants.

To control chloride and TDS, City Ordinance Section 16-10-2D requires users with the potential to discharge chloride at or above the threshold level of 350 mg/L and/or TDS above the threshold level of 1,800 mg/L to implement appropriate pretreatment or BMPs.

Additional control strategies for boron, chloride, fluoride and TDS include

- developing and enforcing a general policy addressing use of softening and reverse osmosis by large-volume users; and
- reserving capacity for discharge loads of these pollutants from proposed high-quality water treatment facilities.

### 6.2.4 Summary of Numeric Limits and Other Control Strategies for Toxic Pollutants

Numeric limits and other control strategies for toxic pollutants are addressed in City Ordinance Section 16. This Section

- applies Prohibited Discharge Standards to all users (Section 16-9-1),
- requires all users to treat wastewater discharges as necessary to comply with these prohibitions and with categorical and local limits as applicable (Section 16-10),
- implements numeric local limits for arsenic, boron, cadmium, copper, cyanide, fluoride, lead, mercury, selenium, and zinc and user-specific limits for total chromium and nickel (Section 16-9-3). These limits apply to all users required to obtain a Class I permit (i.e., SIUs) (Section 16-11-2C) and apply as Daily Maximum Limits. These are incorporated verbatim in a table in Section 16-9-3B.
- expresses specific language authorities of the Director to apply the local limits (Sections 16-9-3A, 16-9-3B2 and 3, 16-9-3C1, 16-9-3D and 16-9-3B),
- requires control of flow and specific discharges and accidental/slug discharges (Section 16-10 subsections),
- requires users with the potential to discharge chloride and/or TDS above threshold levels to implement appropriate treatment (Section 16-10-2D),

Additional control strategies for boron, chloride, fluoride and TDS include

- developing and enforcing a general policy addressing uses of softening and reverse osmosis, and
- estimating discharge loads of chloride and TDS from future advanced water treatment facilities and reserving capacity accordingly.

### 6.3 Numeric Limits and Other Control Strategies: Conventional Pollutants and Nutrients

This section describes the evaluation of local limits for conventional pollutants and nutrients. These include BOD, TSS, and TKN.

Conventional pollutants and nutrients are common constituents of wastewater generated through domestic uses like personal hygiene and cleaning. POTWs are typically designed to remove these constituents. In newer areas, use of water-saving devices such as low-flow toilets have increased concentrations of conventional pollutants and nutrients from residential and other non-industrial users. At many POTWs domestic discharges from households and from workplaces account for major portions of the influent loads of these pollutants; however, some industries, like food processors, may contribute significant amounts of these pollutants to the POTW.

The AZPDES permits issued to Central Buckeye WWTP, Sundance WRF, Festival Ranch WRF and Tartesso WRF include maximum allowable discharge limitations expressed as weekly and monthly concentration and mass limits. A minimum removal rate of 85 percent is also required. As shown in Table 5.6, uncontrolled loading of BOD exceeds the design-based MAHL at Sundance WRF, and uncontrolled loadings of TKN exceed the design-based MAHL at both Buckeye facilities. UCLs could not be calculated for these pollutants. The preliminary analyses of Festival Ranch and Tartesso WRFs showed moderate influent loadings of conventional pollutants.

An allocation method based on progressive capacity evaluations was developed for all conventional pollutants—BOD, TSS, and TKN. Like the user-specific allocation method for toxic pollutants introduced in Section 6.2.2, it allots portions of the MAIL to prospective controlled sources according to a user-specific evaluation of each proposed discharge. It creates a reserve where capacity is contributed by users with low-concentration discharges and drawn upon by users with high-concentration discharges. The strategy consists of an initial evaluation, conducted at the planning and development stage, followed by a discharge load evaluation, allocation and permitting, as described for toxic pollutants in Section 6.2.2. Appendix F-4.2 presents a simplified example of this method for BOD for Sundance WRF.

Control mechanisms for conventional pollutants are addressed in City Ordinance Sections 16-9 and 16-11:

- Users are prohibited from introducing or causing to be introduced into the POTW pollutants, including oxygen-demanding pollutants (BOD, etc.) released in a discharge which, either singly or by interaction with other pollutants, will cause interference with the POTW (Section 16-9-1B4)
- The Director is authorized to establish user-specific limits for BOD, TSS and TKN for users discharging under Class I or Class II permits (Section 16-9-3). Class II permits may be issued to high strength users who are not otherwise required to obtain a permit. A high strength user is one whose discharge equals or exceeds 2.5 percent of the loading capacity (by mass) of either BOD or TSS or TKN irrespective of the actual discharge volume (Section 16-11-2C2).

In addition to the control mechanisms just discussed, a financial incentive exists for users to control their discharge of BOD or TSS. All users are charged fees based upon the amount discharged. Charges may also be assessed for “any other pollutant which causes an increase in the cost of treatment” (City Ordinance Section 16-7-1). Should capacity issues arise at a treatment facility, capacity may be optimized or redefined by

- analyzing mass balances,
- modelling, stress testing, and/or pilot testing, benchmarking, and/or
- evaluating current operations.

## 6.4 Control Strategies: Oil and Grease

Oil and grease qualified as pollutants of concern at both Central Buckeye WWTP and Sundance WRF based on water quality criteria. Oil and grease are common constituents of industrial and non-industrial wastewaters. They are typically regulated by POTWs for two reasons:

- Oil and grease may accumulate and congeal in the collection system and at treatment facilities, reducing pipe and pump capacities, interfering with instruments, reducing treatment efficiency, and increasing operation and maintenance costs.
- Petroleum and other mineral-based oils may have an adverse impact on biological wastewater treatment processes or pass through the POTW, causing effluent permit violations.

Typical sources of animal- and vegetable-based oil and grease, commonly known as fats, oils and grease, or FOG (measured as hexane extractable material by USEPA Method 1664A), include residences, food service facilities (FSFs) like restaurants, institutions like schools and hospitals, food processors, and food-based industries. Industrial and commercial laundries may contribute both FOG from washing linens used in restaurants as well as mineral-based oil and grease from washing uniforms and rags that are soiled with petroleum oil and grease.

Although a numeric limit for FOG can be determined from theoretically or empirically derived MAHLs, this approach requires extensive characterization of collection system characteristics and cannot fully account for all the factors (e.g., temperature, discharges from other users) that affect the fate of oil and grease in the collection system and at the WRF. The method does not account for the technical achievability of the resulting limit.

In most cases, industrial, commercial, and institutional sources of FOG can be more effectively controlled through active source management programs, which enforce requirements for installation, proper operation, and routine maintenance of grease interceptors or other pretreatment devices. Residential sources may be addressed through public education, awareness and participation programs.

Excessive levels of mineral oil and grease (measured as total petroleum hydrocarbons, or TPH, by USEPA Modified Method 8015) can be discharged not only in process waste streams by industrial manufacturers but also through activities at commercial users, such as cleaning of work surfaces or waste disposal of petroleum products at auto shops and other vehicle service facilities (VSFs). A numeric limit for mineral-based oil and grease, if technologically achievable, can be usefully applied in prompting and enforcing action.

Control mechanisms for oil and grease are addressed in City Ordinance Sections 16-9 through 16-11.

- Users are prohibited from discharging pollutants that will cause interference (City Ordinance Section 16-9-1A and 16-9-1B3)
- Users are prohibited from introducing or causing to be introduced into the POTW
  - petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through (Section 16-9-1B6)
  - fats, oils, or greases of animal or vegetable in amounts that will cause interference or pass through (Section 16-9-1B17)
- When in the opinion of the water resources department interceptors for grease and oil are necessary, the user is required to provide and maintain properly sized and installed interceptor(s); keeping written records and documentation of cleaning, repair, calibration and maintenance. Unless approved by the Director no interceptor installed pursuant to this section shall have a capacity less than 750 gallons nor greater than 2,500 gallons. (Section 16-10-2B).
- The Director has the discretion to use general permits to control non-SIU or commercial user discharges to the POTW under certain conditions. General permits may require users to institute BMPs (Section 16-11-6). Appendix F-6 presents example BMPs for vehicle service facilities and food service facilities.

## 6.5 Summary of Control Strategies

Table 6.2 summarizes recommended control strategies in comparison to the City Ordinance in effect at the time of the study. Appendix F-5 presents a comparison of the recommended limits and other control strategies with other westside Cities, including Avondale, Glendale, Goodyear, Peoria and Surprise.

Table 6.2 Comparison of Recommended Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances			
Pollutant	2012 Code of Ordinances Limit (mg/L)	Code of Ordinance Limit (mg/L)	Applies to
<b>Toxic Pollutants</b>			
Arsenic	-	0.035	SIUs
Boron	10.0	1.1	SIUs
Cadmium	0.10	0.028	SIUs
Chloride (1)	-	350	All Users
Chromium (2)	0.5	User-Specific	Selected IUs and SIUs
Copper	10.0	5.0	SIUs
Cyanide	2.0	0.78	SIUs
Fluoride	0.5	11	SIUs
Lead	-	0.74	SIUs
Mercury	0.05	0.0080	SIUs

**Table 6.2 Comparison of Recommended Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances**

Pollutant	2012 Code of Ordinances Limit (mg/L)	Code of Ordinance Limit (mg/L)	Applies to
Nickel	-	User-Specific	Selected IUs and SIUs
Selenium	0.10	0.0074	SIUs
TDS (1)	-	1800	All Users
Zinc	50.0	<b>166</b>	SIUs

**Conventional Pollutants**

BOD	300	User-Specific (3)	Selected IUs and SIUs
TSS	-	User-Specific (3)	Selected IUs and SIUs
TKN	-	User-Specific (3)	Selected IUs and SIUs
Oil and Grease		(3)	All Users

*Notes: (1) The values shown are threshold values. Users who exceed these threshold values may be required to implement controls. (2) The City Ordinance limit in effect at the time of this study applies to hexavalent chromium; user-specific limit applies to total chromium. (3) The City Ordinance also prohibits discharges of pollutants in amounts that will cause interference or passthrough and gives the Director the discretion to issue permits and/or require users to implement BMPs.*

## 6.6 Sampling, Reviews, Re-evaluations and Updates

Due to the potential for growth in the City's service areas, the City will implement the following practices.

- Sampling (Section 6.6.1)
- Investigations (Section 6.6.2),
- Reviews of new users (Section 6.6.3)
- Annual reviews (Section 6.6.4)
- Industrial User Survey (Section 6.6.5)
- Re-evaluations and updates (Section 6.6.6)
- Other actions (Section 6.6.7)

### 6.6.1 Sampling

The City will

- Conduct monthly sampling of the influent flow at all facilities in concert with monthly effluent compliance samples for pollutants identified as potential site-specific POCs at each facility, track data and note trends.
  - **Central Buckeye WWTP:** arsenic, boron, chloride, copper, selenium, TDS, BOD, TSS, nitrogen compounds (nitrite, nitrate, TKN), oil and grease.
  - **Sundance WRF:** arsenic, boron, chloride, chromium, fluoride, BOD, TDS, TSS, nitrogen compounds (nitrite, nitrate, TKN), oil and grease.
  - **Festival Ranch WRF:** boron, chloride, copper, fluoride, selenium, zinc, BOD, TDS, TSS, nitrogen compounds (ammonia, nitrite, nitrate, TKN), oil and grease.
  - **Tartesso WRF:** arsenic, chloride, fluoride, BOD, TDS, TSS, nitrogen compounds, and oil and grease.
- Conduct targeted collection system sampling to evaluate the potential of residential and non-residential users in the Festival Ranch service area to discharge ammonia, selenium, zinc and total nitrogen.
- Perform dry concentration analyses of arsenic, chromium and nickel on biosolids/sludge in conjunction with required TCLP analyses to provide basis for biosolids/sludge limits development if it becomes necessary.

### 6.6.2 Investigations

The City will establish a practice of notifying pretreatment staff immediately of exceedances of effluent limitations to allow timely investigation of potential causes. Pretreatment staff will investigate unusual levels of POCs through the use of upstream sampling and walk-through inspections of non-domestic users to determine the source of the POC.

### 6.6.3 Reviews of New Users

The City will conduct reviews when new industrial users (IUs) move through the City's planning and development process. The City will determine if the IU qualifies for regulation by numeric local limits. If the IU qualifies, the City will

- *For anticipated discharges of pollutants regulated by UCLs*, compare the estimated volume of controlled flow from the IU to the industrial flow service area reserve and determine whether the IU can be accommodated.
- *For anticipated discharges of pollutants regulated by user-specific limits*, compare the estimated controlled load from the IU to the industrial load service area reserve and determine whether the IU can be accommodated.

If the IU is accepted, the reserves will be adjusted by the flow and load allocated to the IU.

For all new IUs, the City will

- Consider the potential of the IU's discharge to exceed applicable permit limitations or water quality standards not regulated by numeric local limits.
- Evaluate the need for pretreatment, BMPs or alternate disposal for users with the potential to discharge TDS above the threshold level of 1800 mg/L and require control measures if appropriate, per City Ordinance Section 16-10-2D.
- Evaluate the need for pretreatment, BMPs or alternate disposal for users with the potential to discharge chloride above the threshold level of 350 mg/L and require control measures if appropriate, per City Ordinance Section 16-10-2D.

#### 6.6.4 Annual Reviews

Annual reviews are conducted to identify changes that could affect plant performance and compliance. The City will

- *For all pollutants*, update calculations of influent loads and compare to MAHLs. If influent loads exceed USEPA-suggested thresholds, re-evaluate control strategies.
- *For toxic pollutants controlled by UCLs*, update calculations of service area flows from uncontrolled sources and controlled (permitted) sources and compare balance to available controlled flow capacity at each facility.
- *For toxic and conventional pollutants controlled by user-specific limits*, review status of pollutant-specific reserve capacities at each facility.
- *For copper, cyanide and zinc*, correlate influent concentrations with process performance. Identify and respond to signs of potential inhibition.
- *For arsenic, cadmium, chromium, lead, mercury, and selenium*, compare results of TCLP analyses to Federal limits for landfilling. Identify and respond to signs of passthrough.

#### 6.6.5 Industrial User Survey

An IUS was performed in preparation for the local limits study. The City will update the IUS continually by conducting the following ongoing activities in regard to industrial users:

- review of applications for water or wastewater service,
- review of business license applications,
- review of building permit applications,
- review of newspapers, yellow-book advertising, etc.,
- internet searches,
- interface with local chamber of commerce,
- interface with trade associations,
- coordination with internal departments and local agencies such as utilities, code enforcement, health, and fire departments,
- drive-by reconnaissance of the jurisdiction by POTW personnel, and
- performance and documentation of walk-through inspections as needed.

#### 6.6.6 Re-evaluations and Updates

Re-evaluations and updates are triggered by APDES permit and APP renewals, changes in other environmental criteria, changes at treatment facilities (process modifications, expansions), and non-compliance with AZPDES permit or APP limits or other environmental criteria. Local limits should be re-evaluated at least every five years.

#### 6.6.7 Other Actions

Should capacity issues for conventional pollutants arise at one or both treatment facilities, the City can optimize or redefine capacity by

- analyzing mass balances,
- modelling, stress testing, and/or pilot testing, benchmarking, and/or
- evaluating current operations.

## Section 7 Implementation of Local Limits

This section summarizes the actions necessary to implement local limits. Section 7.1 summarizes control strategies for toxic pollutants, conventional pollutants and oil and grease, and Section 7.2 summarizes sampling, reviews, re-evaluations and updates.

### 7.1 Control Strategies

This section summarizes implementation of control strategies for toxic pollutants, conventional pollutants and oil and grease detailed in Sections 6.2 through 6.6.

#### 7.1.1 Toxic Pollutants

The City will

- Implement UCLs for the following pollutants: arsenic, boron, cadmium, copper, cyanide, fluoride, lead, mercury, selenium, and zinc.
- Implement user-specific limits for total chromium and nickel.
- Evaluate need for pretreatment, BMPs or alternate disposal for users with the potential to discharge chloride or TDS at or above threshold levels of 350 mg/L chloride and 1800 mg/L TDS. If estimated discharge concentrations exceed threshold levels, the City will require implementation of appropriate control mechanisms, per City Ordinance Section 16-10-2D.
- Consider developing a general City-wide policy addressing use of softening and reverse osmosis by large-volume users.
- Estimate discharge loads of boron, chloride, fluoride and TDS from proposed advanced water treatment facilities and reserve loading capacity accordingly.

#### 7.1.2 Conventional Pollutants

The City will

- Prohibit users from discharging pollutants that will cause interference, per City Ordinance Section 16-9-1B4.
- Implement user-specific limits for BOD, TSS, and TKN for high-strength users and issue permits, per Ordinance Section 16-11-2C2.

#### 7.1.3 Oil and Grease

The City will

- Prohibit users from discharging pollutants that will cause interference, per City Ordinance Section 16-9-1B4.
- Enforce specific prohibitions and requirements for interceptors, per City Ordinance Sections 16-9-1 B6 and 17 and Section 16-10-2B.
- At the Director's discretion, issue general permits to control discharges from non-SIU or commercial users (such as vehicle service facilities and food service facilities). General permits may require users to institute BMPs.

### 7.1.4 Summary of Control Strategies

Table 7.1 summarizes control strategies in comparison to the City's 2012 Code of Ordinances.

Table 7.1 Comparison of Controls for Central Buckeye WWTP and Sundance WRF with City of Buckeye 2012 Code of Ordinances			
Pollutant	2012 Code of Ordinances Limit (mg/L)	Code of Ordinance Limit (mg/L)	Applies to
<b>Toxic Pollutants</b>			
Arsenic	-	0.035	SIUs
Boron	10.0	1.1	SIUs
Cadmium	0.10	0.028	SIUs
Chloride (1)	-	350	All Users
Chromium (2)	0.5	User-Specific	Selected IUs and SIUs
Copper	10.0	5.0	SIUs
Cyanide	2.0	0.78	SIUs
Fluoride	0.5	11	SIUs
Lead	-	0.74	SIUs
Mercury	0.05	0.0080	SIUs
Nickel	-	User-Specific	Selected IUs and SIUs
Selenium	0.10	0.0074	SIUs
TDS (1)	-	1800	All Users
Zinc	50.0	<b>166</b>	SIUs
<b>Conventional Pollutants</b>			
BOD	300	User-Specific (3)	Selected IUs and SIUs
TSS	-	User-Specific (3)	Selected IUs and SIUs
TKN	-	User-Specific (3)	Selected IUs and SIUs
Oil and Grease		(3)	All Users

Notes: (1) The values shown are threshold values. Users who exceed these threshold values may be required to implement controls. (2) The City Ordinance limit in effect at the time of this study applies to hexavalent chromium; user-specific limit applies to total chromium. (3) The City Ordinance also prohibits discharges of pollutants in amounts that will cause interference or passthrough and gives the Director the discretion to issue permits and/or require users to implement BMPs.

## 7.2 Other Ongoing Activities

This section summarizes other ongoing activities associated with implementation of local limits as detailed in Section 6.6.

### 7.2.1 Sampling

The City will

- Conduct monthly sampling of the influent flow at all facilities in concert with monthly effluent compliance samples for pollutants identified as potential site-specific POCs at each facility, track data and note trends.
- Conduct targeted collection system sampling to evaluate the potential of residential and non-residential users in the Festival Ranch service area to discharge ammonia, selenium, zinc and total nitrogen.
- Perform dry concentration analyses on biosolids/sludge in conjunction with required TCLP analyses.

### 7.2.2 Investigations

The City will notify pretreatment staff immediately of exceedances of effluent limitations to allow timely investigation of potential causes. Pretreatment staff will investigate unusual levels of POCs through the use of upstream sampling and walk-through inspections of non-domestic users to determine the source of the POC.

### 7.2.3 Reviews and Industrial User Survey

The City will

- Conduct reviews of new IUs as they move through the City's planning and development process.
- Evaluate the need for pretreatment and require BMPs or alternate disposal when necessary for non-SIU dischargers of oil and grease, TDS and/or chloride.
- Conduct annual reviews to identify changes that could affect plant performance and compliance.

The City will update the IUS continually, through reviews of new users, drive-by reconnaissance of the jurisdiction, and walk-through inspections as needed.

### 7.2.4 Re-evaluations and Updates

The City will re-evaluate local limits in response to

- AZPDES permit and APP renewals,
- changes in other environmental criteria,
- changes at treatment facilities (process modifications, expansions), and
- non-compliance with AZPDES permit or APP limits or other environmental criteria.

Local limits will be re-evaluated at least every five years.

### 7.2.5 Other Actions

Should capacity issues for conventional pollutants arise at one or both treatment facilities, the City can optimize or redefine capacity by

- analyzing mass balances,
- modelling, stress testing, and/or pilot testing,
- benchmarking and/or evaluating current operations.

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CITY OF BUCKEYE, ARIZONA

# Section 4 – Identification of Non-Domestic Users

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PRETREATMENT PROGRAM SUBMITTAL

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## Table of Contents

<b>4. Identification of Non-Domestic Users</b>	<b>1</b>
4.1 Background.....	1
4.2 Initial Industrial/Commercial Wastewater Preliminary Survey.....	2
4.3 Local Limits Study .....	2
4.4 Industrial/Commercial Wastewater Industrial Waste Survey.....	4

## List of Appendices

- Appendix 4-A IWS Procedures
- Appendix 4-B Example Cover Letter and Initial Pretreatment Survey
- Appendix 4-C Initial List of Non-Domestic Users Surveyed
- Appendix 4-D Revised List of Non-Domestic Users Surveyed
- Appendix 4-E Permit Application Notice
- Appendix 4-F Wastewater Discharge Permit Application
- Appendix 4-G RCRA Information Brochure
- Appendix 4-H Hazardous Waste Reporting Factsheet



## 4. Identification of Non-Domestic Users

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### 4.1 Background

As required by 40 Code of Federal Regulations (CFR) Section 403.8(f)(2) of the General Pretreatment Regulations, publicly owned treatment works (POTW) must identify and locate all possible users subject to its pretreatment program, and identify the volume and character of pollutants discharged by these users. This information is typically gathered through an Industrial Waste Survey (IWS). Five basic items of information are required to adequately document the IWS. They are:

- The sources used to compile the master list of non-domestic users also referred to as industrial users (IUs)
- The methods used for the survey
- A copy of the survey form and cover letter sent to IUs, including the dates the forms were sent
- The master list of IUs that summarizes the survey results,
  - Indicating IUs eliminated from the survey and justification for elimination
  - Identifying IUs affected by the City's pretreatment program and their classification
  - Listing pollutants known or suspected to be discharged from each IU

Of major interest are significant industrial users (SIUs). An SIU is an IU that is subject to federal categorical pretreatment standards, or an IU that:

- Discharges 25,000 gallons per day (gpd) or more of process wastewater (excluding sanitary, noncontact cooling, and boiler blowdown wastewater)
- Contributes a process wastestream making up five percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant
- Poses reasonable potential to adversely affect the POTW's operation or violate any pretreatment standard or requirement

Minor IUs may also be of interest, including small industries and commercial users who individually do not pose potential threats to the POTW, receiving water quality, or biosolids/sludge quality, but together may impact the collection and/or treatment systems.

## 4.2 Initial Industrial/Commercial Wastewater Preliminary Survey

The City of Buckeye (City) began conducting an IWS in December of 2018 following written procedures developed for the process (Appendix 4-A). On November 15, 2018, the City mailed a cover letter and survey form to approximately 166 non-domestic users who had an active water account. In those instances of multi-tenant facilities being provided water through a single account/meter, each tenant was noticed and surveyed. The cover letter explained the purpose of the survey, notified the user of the possibility of an inspection, and that the City would complete the survey on-site with the business representative present. See Appendix 4-B.

The initial surveys continued through May of 2019. The initial mailing list is provided at Appendix 4-C. Since 2019, an additional 67 users have been identified. A table summarizing the results of the initial survey and revised survey is provided in Section 4.4.3.

Since the initial survey was conducted, the survey process has been bolstered through interdepartmental cooperation, making identification of non-domestic users possible in a very timely manner, which is described in section 4.4.1.

The Environmental Compliance Officer – Pretreatment (“ECO”), reviewed and updated the initial survey during 2020. In several instances it was noted the businesses previously surveyed were closed and a new business has replaced the original business contacted. The additional “revised” survey list is attached in Appendix 4-D.

## 4.3 Local Limits Study

A Local Limits Study (see Buckeye PPS Section 3 Local Limits) was completed and approved by ADEQ on August 26, 2020. Flow and loading analysis was conducted using pollutant concentration data from sampling events in April and March 2019. The study resulted in pollutant control strategies the City will implement:

- MAHL-based local limits for control of SIU discharges of arsenic, boron, cadmium, total chromium, copper, cyanide, fluoride, lead, mercury, selenium and zinc;
- MAHL-based local limits for control of discharges of BOD, TSS and TKN from high-strength users;
- require implementation of appropriate control measures, which may include pretreatment and/or best management practices (BMPs) for chloride and total dissolved solids (TDS), BOD, TSS and oil and grease.

Regarding investigations, reviews, the industrial waste survey (IWS), re-evaluations and updates, the City will perform:

- investigation of effluent limitation exceedances and unusual levels of POCs;
- reviews of new IU and non-SIU dischargers of oil and grease, TDS and/or chloride to evaluate need for further action;
- annual reviews to identify changes that could affect plant performance and compliance;
- ongoing updates to the IWS; and
- re-evaluations and updates triggered by permit renewals and changes in environmental criteria at treatment facilities.

#### **4.4 Industrial/Commercial Wastewater Industrial Waste Survey**

The City intends to conduct surveys on a continuing basis through utilization of data obtained through interdepartmental cooperation such as data provided by the building permit process, water accounts, and tax & license data.

The ECO receives this information either on an as needed basis, or quarterly each year. When a new user is identified, an onsite survey will be conducted. The Buckeye survey process is an ongoing activity that allows the City to provide an educational and a positive experience to compliance beginning with each survey completed. The IWS will be conducted as described in this section.

##### **4.4.1 Sources Used to Identify IUs**

The City will use its business license, building permit and utility billing data to identify non-domestic users who have the potential to be a significant and/or industrial user, requiring permitting. The City will use one or more search engines designed to identify potential users located within the boundaries of the POTW by NAICS code and key word searches. One such search engine is Reference USA, a free tool available at public libraries in Arizona and used in the searches conducted by the City in 2018 and 2019. In addition to the inter-departmental information received, water consumption records will be used to identify non-domestic users. Users who routinely purchase 25, 000 gallons per day of use (billed volume / days of operation) will be surveyed/inspected to determine if a categorical operation or other activity that could impact the POTW is being conducted.

##### **4.4.2 Survey Methods**

The City has implemented a tiered approach, described below. Direct contact with the users is the most effective means for pretreatment staff to learn the sewer system and the users discharging to their system. As is the norm for most pretreatment programs the City did mail the

initial survey form to be transparent about the data the City was requesting. It was recommended the City conduct the survey's in person in lieu of requesting the businesses to complete and return the survey. Mailing information to provide notice to users is a useful tool to inform users of proposed local limits and to communicate with classes of users for specific purposes e.g., notices to Dental Offices concerning the dental amalgam rule. As stated previously completing the survey in person allows the pretreatment staff to become knowledgeable of the user's operation as well as the users personally.

The tiered approach is designed to allow the pretreatment staff to properly document the activities occurring at the facility on the first visit. By physically completing a survey with the user during the initial site visit, administrative time is decreased by avoiding multiple phone calls and secondary visits to complete detailed forms not applicable for many of the non-domestic users.

The initial tier requires the completion of a single page questionnaire completed by pretreatment staff during the initial contact with the user. Prior to the survey being completed, the user is provided with a "Notice of Inspection Rights."

In the event a user is identified conducting an operation that has potential to impact the proper operation of the POTW, pretreatment staff will work directly with the user to complete the second tier which is the application / questionnaire. In accordance with 40 CFR 403.8(f)(2)(iii), the user identified as a SIU will be notified of applicable pretreatment standards and requirements and a summary of RCRA requirements. The complete package supplied to the SIU will consist of:

- Permit Application Notice (Appendix 4-E)
- Wastewater Discharge Permit Application (Appendix 4-F)
- RCRA Information Brochure (Appendix 4-G)
- Hazardous Waste Reporting Factsheet (Appendix 4-H)
- Chapter 16 of the Buckeye City Code (Appendix 2-B)

The Wastewater Discharge Permit Application serves as a portion of the baseline monitoring report (BMR) should there be a need to individually permit an industrial user. The application / questionnaire will request at a minimum the following information:

- Description of activities conducted at location, where water is used and where waste is generated
- Chemicals used and chemicals located onsite
- Schematic showing pretreatment system (if any), floor drains, and connections to sewer
- Location of sewer connections
- Description of pretreatment facilities and practices

- Residuals generated and disposal methods
- Pollution prevention measures

Initial and secondary tier documentation is being inputted into Linko Pretreatment and FOG Management software. By establishing an electronic record of the initial survey process, the status of the user can be maintained while the user remains active in the POTW. Users who do not meet criteria to be permitted but do raise concerns, will be re-visited approximately every 12 to 15 months; users who did not raise concerns should be re-visited every 36 to 60 months. Triggers will be developed to aide in scheduling future inspections, or as some agencies refer to, completing walk through inspections.

Although the survey process has been met with no negativity on the part of the users visited, in the event a user refuses to cooperate, an escalating process will be utilized to obtain the information required to assure the user is following the Buckeye City Code. Failure to submit a completed survey shall be addressed in the steps outlined in the Code and Enforcement Response Plan (ERP).

**4.4.3 Compilation of Master List of IUs**

The City has not identified any categorically regulated processes that are connected to the POTW. Two users of the sanitary sewer were identified through the survey process as potential SIU’s due to discharge of process wastewater greater than 25,000-gallons per day. Several facilities that may have categorically regulated processes have been identified through the survey process as being located within the City of Buckeye limits in an area of the City which is not provided sewer service. These facilities have been identified, documented, and will be addressed when sewer service is constructed to the respective properties.

The following table provides a summary of the survey. Each non-domestic user surveyed was assigned a code for classification purposes and for future input into the City’s pretreatment tracking software which described in Section 4.4.2.

Classification	# in class	Concern
0000 - Within City limits, not serviced with sewer.	7	Metal finisher fertilizer formulator, Concrete mfg. Chemical supplier in operation. City will monitor under survey procedures

9999 – Users with “domestic like” discharge only.	91	Commercial entities such as sales, Insurance, Real estate, barbers etc. “Domestic like” wastewater is discharged.
AUTO- ##### - Service, repair, sales for vehicles.	20	Discharge of pollutants, such as hydrocarbon’s, lead, copper, etc., as the result of service and repair work.
DT-0000 – Dental Office	26	City is in the process of conducting dental surveys in order to be in compliance with Dental Amalgam Rule at time of program approval.
FOG-0000 – Food Service Establishments	69	Discharge of fats, oils, grease, high TSS, COD, low/high pH discharge. City actively working with FOG sources, reviewing cleaning and inspecting cleaning of pretreatment equipment.
PT-0000 – Pretreatment facility of concern	16	Medical, Laundry, Dry Cleaning facilities that will be inspected by the City on a routine basis. Surveillance monitoring of facilities / main sampling may be completed.
SIU-0000	2	Possible SIU due discharge of process wastewater greater than 25,000-gallons per day.
WH-0000 – Waste Haulers	2	Discharge of wastewater with high strength, unknown pollutants, and debris into the POTW. The City is currently working with two facilities and addressing concerns with owners.

- Those with a code of 9999 will be documented as users with “domestic like” flow and will not be required to complete further documentation although they are subject to Chapter 16 of the City Code, Section 16-9-1 - Prohibited Discharge Standards. As stated previously this type of user will be re-surveyed every 36 to 60 months.

- The users with codes AUTO, FOG and PT will be inspected for best management practices and waste types/quantities being generated and/or discharged. If concerns are noted additional information will be required up to the possibility of permitting individually.
- DT – dental offices are being surveyed prior to pretreatment program approval to meet the requirements of the Dental Amalgam Rule at time of program approval.
- WH – There are two facilities classified as waste haulers. Both are requiring monitoring by Collections staff and the ECS is being involved to address improper discharges.

CITY OF BUCKEYE, ARIZONA

# Section 5 – Permits and Fact Sheets

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PRETREATMENT PROGRAM SUBMITTAL

FINAL

7/1/2021



## Table of Contents

<b>5. Permits and Fact Sheets</b>	<b>1</b>
5.1. Background .....	1
5.2. Permitting Procedures .....	1
5.2.1. Permit Duration (Article 16-12-1) .....	1
5.2.2. Permit Contents (Article 16-12-2) .....	1
5.2.3. Permit Modification (Article 16-12-4) .....	3
5.2.4. Permit Transfer (Article 16-12-5) .....	3
5.2.5. Permit Revocation and Reissuance (Article 16-12-6).....	3
5.3 Fact Sheets .....	4
5.4 Dental Facilities.....	4

## List of Appendices

- Appendix 5-A SIU Sample Permit
- Appendix 5-B SIU Fact Sheet Template
- Appendix 5-C Permit Standard Conditions
- Appendix 5-D Dental Amalgam Compliance Form



## 5. Permits and Fact Sheets

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### 5.1. Background

The General Pretreatment Regulations, 40 Code of Federal Regulations (CFR) Part 403, require the City of Buckeye (City) to control wastewater discharges from significant industrial users (SIUs) through permits or similar means to ensure compliance with pretreatment standards and requirements. The regulations also specify that individual control mechanisms, in the form of permits, be issued to SIUs and be enforceable by the City.

As of September 2020, no SIUs operate within the City's jurisdiction or discharge wastewater to the City's Publicly Owned Treatment Works (POTW). This chapter describes the permitting procedures to be implemented for future SIUs. Templates for the industrial wastewater discharge permit (Permit) and fact sheet are included in Appendices 5-A and 5-B.

### 5.2. Permitting Procedures

The City's legal authority to issue Permits is based on Buckeye City Code, Chapter 16 Sewer Utilities and Use of Public Sewers, Article 16-11 (SUO). The SIU is responsible for obtaining a Permit from the Water Resources Director (Director) prior to discharging any wastewater to the POTW.

#### 5.2.1. Permit Duration (Article 16-12-1)

Permits are issued for a specified time period up to five years from the effective date of the permit. A permit may be issued for a period less than five years, at the discretion of the director.

#### 5.2.2. Permit Contents (Article 16-12-2)

A Permit will include such conditions as are deemed reasonably necessary by the Director to prevent pass-through or interference, protect the quality of the POTW's effluent, protect worker health and safety, facilitate sludge management and disposal, protect against damage to the POTW, and prevent sanitary sewer overflows. Information contained in the permit must include the following:

- A statement that indicates the wastewater discharge permit issuance date, expiration date and effective date;
- A statement that the wastewater discharge permit is nontransferable without prior notification to the city in accordance with Section 16-12-5 of the SUO, and provisions for furnishing the new owner or operator with a copy of the existing wastewater discharge permit;
- Effluent limits, including best management practices, based on applicable pretreatment standards;
- Self-monitoring, sampling, reporting, notification, and record-keeping requirements. These requirements shall include an identification of pollutants (or best management practice) to be monitored, sampling location, sampling frequency, and sample type based on federal, state, and local law.
- The process for seeking a waiver from monitoring for a pollutant neither present nor expected to be present in the discharge in accordance with Section 16-13-4B of the SUO.
- A statement of applicable civil and criminal penalties for violation of pretreatment standards and requirements, and any applicable compliance schedule. Such schedule may not extend the time for compliance beyond that required by applicable federal, state, or local law.
- Requirements to control slug discharge, if determined by the director to be necessary.
- Any grant of the monitoring waiver by the director must be included as a condition in the user's permit.

Information contained in the permit may contain:

- Limits on the average and/or maximum rate of discharge, time of discharge, and/or requirements for flow regulation and equalization;
- Requirements for the installation of pretreatment technology, pollution control, or construction of appropriate containment devices, designed to reduce, eliminate, or prevent the introduction of pollutants into the treatment works;
  - When installed such devices must at all times be properly operated and maintained.
  - Written operating and maintenance logs shall be maintained on-site.

- Requirements for the development and implementation of spill control plans or other special conditions including management practices necessary to adequately prevent accidental, unanticipated, or nonroutine discharges;
- Development and implementation of waste minimization plans to reduce the amount of pollutants discharged to the POTW;
- The unit charge or schedule of user charges and fees for the management of the wastewater discharged to the POTW;
- Requirements for installation and maintenance of inspection and sampling facilities and equipment, including flow measurement devices;
- A statement that compliance with the individual wastewater discharge permit or the general permit does not relieve the permittee of responsibility for compliance with all applicable federal and state pretreatment standards, including those which become effective during the term of the individual wastewater discharge permit or the general permit; and
- Other conditions as deemed appropriate by the director to ensure compliance with this chapter, and state and federal laws, rules, and regulations.

### **5.2.3. Permit Modification (Article 16-12-4)**

The Director may modify permits for good cause, including the incorporation of new or revised federal, state, or local pretreatment standards or requirements; a change in the POTW that requires either a temporary or permanent reduction or elimination of the authorized discharge; and to reflect a transfer of the facility ownership or operation to a new owner or operator, among other reasons. Misrepresentation or failure to disclose all relevant facts in the permit application or reports, or violation of permit terms and conditions may also justify permit modification.

### **5.2.4. Permit Transfer (Article 16-12-5)**

The IU may request transfer of its permit to a new owner or operator upon at least 60 days advance notice to the Director.

### **5.2.5. Permit Revocation and Reissuance (Article 16-12-6)**

The Director may revoke a Permit for good cause, including failure to provide proper notification or to submit required reports; misrepresentation or falsification of information; failure to meet effluent limitations; failure to pay fines or sewer charges; and failure to meet compliance schedules.

An IU with an expiring Permit shall apply for reissuance by submitting a complete permit application at least 90 days prior to its existing permit's expiration.

### **5.3 Fact Sheets**

In addition to the permit, a fact sheet will be generated for each SIU. The fact sheet is a summary of some of the provisions in the Permit. In the event of any inconsistency between the language of the fact sheet and other provisions of the Permit, such other provisions of the Permit shall prevail. Information contained in the fact sheet may include the following:

- Facility information, including name, address, contact information for the owner/operator
- Description of the operations and applicable Standard Industrial Classification (SIC) code
- The Permit expiration date (not to exceed five years in duration)
- Effluent limits based on applicable pretreatment standards and/or requirements for Best Management Practices (BMPs)
- The applicable federal categorical pretreatment standards (adjusted if necessary to account for dilution) and the compliance sampling point where the standards apply
- Limits on average and/or maximum discharge flow rates
- Self-monitoring, sampling, and reporting requirements, including a list of pollutants to be monitored, sampling location(s), sampling frequency, and sample type
- A site map indicating the locations of all compliance sampling points, sewer connections, and sewer laterals

### **5.4 Dental Facilities**

Section 4 of the Pretreatment Program Submittal package includes the results of the City's revised Industrial User Survey (Appendix 4-D). Included within the list of users is 26 facilities potentially subject to EPA's Dental Amalgam Rule, 40 CFR 441. To ensure compliance with the rule, the City will be requiring each dental facility to submit a completed Dental Amalgam Compliance Form (Appendix 5-D).

CITY OF BUCKEYE

# Section 6 – Compliance Monitoring

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PRETREATMENT PROGRAM SUBMITTAL

FINAL

July 01, 2021



**Table of Contents**

**6. Compliance Monitoring** **1**

---

6.1. Background..... 1

6.2. Oversight Monitoring..... 2

6.3. Industrial User Self-Monitoring..... 4

6.4. Monitoring Activities ..... 5

    6.4.1 Site Inspections..... 5

    6.4.2 Wastewater Sampling ..... 6

6.5. Data Management ..... 8

    6.5.1 City Responsibilities ..... 8

    6.5.2 Industrial User Responsibilities ..... 10

**List of Appendices**

- Appendix 6-A Notice of Inspection Rights
- Appendix 6-B Industrial Inspection Procedures Checklist
- Appendix 6-C Inspection Report Form
- Appendix 6-D US EPA Region 4 Wastewater SOP #SESDPROC-306 R4

## 6. Compliance Monitoring

### 6.1. Background

As part of the General Pretreatment Regulations, Title 40 Code of Federal Regulations (CFR) Part 403.8(f)(2)(v) requires that the City of Buckeye (City) develop procedures to:

- Randomly sample and analyze the effluent from Industrial Users;
- Conduct surveillance activities in order to identify, independent of information supplied by Industrial Users, occasional and continuing noncompliance with Pretreatment Standards;
- Inspect and sample the effluent from each Significant Industrial User at least once a year.

The City's compliance monitoring program consists of oversight monitoring (Section 6.2) and self-monitoring by industrial users (Section 6.3). Monitoring activities include the physical inspection of the *entire facility* and collection of all waste streams generated by the industrial user which are being discharged to the POTW or have potential to be discharged in to the POTW (Section 6.4).

Both the City and individual industrial users have responsibilities to maintain records related to compliance monitoring (Section 6.5).

Authority to conduct site inspections, surveillance, and monitoring is described in 40 CFR Part 403.8(f)(1)(v) and at Article 16-14 of the City of Buckeye Municipal Code (Code).

Analytical and sample collection procedures required to obtain accurate flow measurements and representative wastewater samples are described in Articles 16-13-10 and 16-13-11 of the Code.

**Safety Note** – Any type of monitoring or surveillance activities shall be conducted in a manner that is consistent with the safety programs of the City. A confined space is by definition any space that is large enough for an employee to enter fully and perform assigned work which is not designed for continuous occupancy by the employee; and has a limited or restricted means of entry or exit.

Monitoring or surveillance activities that require the entry into confined space(s) shall only be conducted by personnel who have received training in accordance with the Department of Occupational Safety and Health Administration (OSHA) standard for confined spaces, 29 CFR 1910.146.

## 6.2. Oversight Monitoring

The City's Pretreatment Program utilizes three types of industrial monitoring:

- 1) Scheduled on-site monitoring,
- 2) Unscheduled surveillance monitoring, and
- 3) Demand or investigative monitoring.

Monitoring means both the sample collection of the effluent discharge, and inspection of the facility; both of which can be jointly or independently conducted. In all instances of monitoring, the City will comply with the requirements set forth in Arizona Revised Statutes Article 4 Municipal Regulations Section 9-833, Inspections. See Appendix 6-A – Notice of Inspection Rights. This is further discussed in section 6.4.1 – Site Inspections.

*Scheduled on-site monitoring* of permitted users will be conducted at a minimum frequency of twice per year. Monitoring will be completed which involves the systematic sampling and comprehensive inspection of the users discharge to the POTW in accordance with a predetermined schedule. The schedule will be for internal use only and shall never be shared with users.

There are two distinct processes used in conducting the monitoring of the industrial users. The first portion is the inspection process of the entire facility. The second portion is the wastewater sample collection.

One inspection per year is “announced.” The inspection is planned by the Environmental Compliance Officer and scheduled in advance with the industrial user. The sampling portion, conducted whenever possible, is an unannounced site visit with no notice given to the industrial users.

The purpose of scheduled on-site monitoring (inspection portion) is to:

- Collect information to evaluate industry compliance with the significant industrial users (SIU's) Industrial Waste Discharge permit (IWDP) as well as other local, state, and federal pretreatment standards and requirements
- Identify changes in industrial processes that may affect the quality of the industrial discharges and subsequent permit limitations
- Maintain a cooperative as well as a regulatory presence with the industrial community
- Update the POTW's non-domestic user database
- Verify self-monitoring reports submitted to the POTW by industrial users.

*Unscheduled surveillance monitoring* represents a random spot check to evaluate industry compliance. The purpose of unscheduled monitoring is to obtain the ability to collect samples during “normal conditions” and advance notice is not given to the industry. The monitoring may

occur as necessary as determined by the City. The frequency can range from once weekly or even daily when a discharger is suspected of non-compliance with ordinance provisions and requirements.

*Demand, or investigative, monitoring* is usually performed in response to a complaint, a known or suspected violation, or an emergency situation. Demand monitoring is also initiated in response to changes in treatment plant influent characteristics or upset or interference of treatment plant processes. Demand monitoring:

- Determines the nature, duration, and hazard of the discharge
- Provides samples to verify the source and constituents of the discharge
- Ascertains the necessary corrective actions needed to contain or halt the discharge
- Initiates corrective actions, if needed
- Documents information needed for follow-up compliance and enforcement activities

In addition, personnel performing demand inspections in response to an emergency:

- Notify other agencies (local, state, and federal) as applicable
- Make all information on the industry available to the person or agency in charge of the response effort
- Stay in direct contact with the POTW staff for special equipment, remedial actions, injunctions, legal opinions, or other high-level decisions
- Collect and adequately document all information required for enforcement or litigation procedures which may be pursued.

Any additional scheduled and unscheduled industrial inspections and/or monitoring is determined by the Environmental Compliance Officer. Significant or major industrial users receive a minimum of one scheduled on-site inspection per year and one non-scheduled on-site inspection per year. The overall factors to be considered in scheduling inspections include:

- Past performance of and compliance by the industrial users
- Volume of industrial discharge (see table below)
- Type and concentration of pollutants in the discharge
- Adequacy of treatment and expected variability of the discharge
- Nature and frequency of problems in the collection system and at the treatment plant which are the result of industrial discharges
- Number and significance of industrial users
- New or additional pretreatment standards and requirements
- Seasonal production schedule

### 6.3. Industrial User Self-Monitoring

Industrial Users which are SIUs as defined by 40 CFR 403.3 and Article 16-4-1 of the Code, are required to collect wastewater samples to demonstrate compliance with pretreatment regulations and standards according to the specifications listed in their IWDPs (e.g., sampling location, monitoring frequency, and required analytical parameters). Other industrial users may also be required by the City to conduct sampling. All industrial users required to collect samples must follow the requirements for analytical and sampling procedures described in the IWDP and Articles 16-13-10 and 16-13-11 of the Code.

Each industrial user subject to self-monitoring requirements must submit the results of self-monitoring activities to the Pretreatment Program. Industrial users are also required to submit the results of any compliance monitoring conducted independently.

If the City requires IU's to submit data electronically, data submitted to the City will be required to be submitted in compliance with the Cross-Media Electronic Reporting Regulation (CROMERR) and the submittal requirements included in the Program Submittal to ADEQ as well as being codified. As a note, the City is not required to accept data electronically nor is there a deadline for POTW's to implement such a requirement on the IU's. However, considering the fact the software purchased for the pretreatment program is CROMEER compliant it is recommended that the City require IU submittal electronically.

See section 6.5 for further information regarding electronic deliverable data (EDD) submittal.

Categorical industrial users (CIUs) are required to submit the following reports and notifications:

- Baseline Monitoring Reports (BMRs): Existing CIUs, within 180 days after the effective date of a categorical pretreatment standard, and new CIUs, at least 90 days prior to discharge, must report to the City flow and quantity of pollutants to be discharged, as described in Article 16-13-1B of the Code. The permit application (See Appendix 4-D) may serve as the BMR if data required is sufficient as determined by the City.
- Compliance Schedule Progress Reports, if additional pretreatment and/or operation and maintenance are required to meet pretreatment standards, as required by the Compliance Schedule, as described in Article 16-13-1B of the Code.
- Reports on Compliance with Categorical Pretreatment Standard Deadline, as described in Article 16-13-1B of the Code.

All users (SIU, CIU, and non-domestic users), as well as other sources of wastewater designated by the City, shall provide, at their own expense, sampling and analyses at least twice each year (once between January 1 and June 30 and once between July 1 through December 31) in accordance with 40 CFR 403.12, and report the flow and quantity of pollutants discharged, as described in Article 16-13-4 of the Code.

Industrial users must notify the City of any significant changes to the IU's operations or system which might alter the nature, quality, or volume of its wastewater, as described in Article 16-13-5; of potential problems, as described in 16-13-6; of violation, as described in 16-13-8; of the discharge of hazardous waste, as described in 16-13-9.

## **6.4. Monitoring Activities**

The City is responsible for implementing monitoring activities. The following sections describe site inspections and collection of wastewater samples.

### **6.4.1 Site Inspections**

Site inspections serve a number of functions. An initial tour of the facility, prior to permitting and/or conducting sampling for the first time, helps familiarize City personnel with information needed to plan future monitoring activities. Subsequent inspections provide:

- A means to check the completeness and accuracy of the industrial user application (BMR), performance and compliance records
- A basis for deciding on and conducting monitoring activities at the industry
- A means for communicating and developing a good working relationship with industrial users
- A mechanism for maintaining current data on industrial users and determining the users' compliance status
- A means to evaluate construction of pretreatment facilities
- A means to assess the adequacy of the users' self-monitoring procedures and equipment to make certain that samples are collected, handled, and analyzed in accordance with 40 CFR 136 - Guidelines Establishing Test Procedures for Analysis of Pollutants, Article 16-13 and, requirements contained in the IWDP
- A means to evaluate the industrial users' operation and maintenance activities pertaining to pretreatment
- A means to obtain information about changes in industrial processes affecting the quality of industrial discharges, waste residuals handling and disposal practices, spill control practices, and raw materials and chemical inventories

Site inspections serve to establish and maintain good rapport and communication between the City and industrial users. All site inspections are conducted in accordance with Arizona Revised Statutes Article 4 Municipal Regulations Section 9-833, Inspections; applicability. On initiation of, or two working days before, an inspection, the inspector provides in writing (See Appendix 6-A) to the on-site representative of the industrial users the rights described by Section 9-833.A, the name and telephone number of a municipal contact person available to answer questions

regarding the inspection; and the due process rights relating to an appeal of a final decision based on the results of the inspection.

During the site inspection, the inspector interviews the responsible party as listed in the industrial users discharge permit or designated represented as specified in the industrial users Delegation of Authority certification. If necessary, the inspector may speak with additional personnel who have a more thorough knowledge of the workings of the industrial user's facility.

Items checked during the site inspection may include verification and examination of the following including the documentation using digital photography equipment:

- Sampling location specified in the IWDP is adequate for the collection of a representative sample of the wastewater
- Industrial user's sampling technique produces representative samples
- Parameters specified in the IWDP are adequate to cover all pollutants of concern that may be discharged by the industrial users
- Appropriate effluent limits are being applied at the sampling location specified in the IWDP

An industrial inspection procedures checklist (see Appendix 6-B) is used to guide the Environmental Compliance Officer and other staff as necessary through inspection preparation, on-site activities, and follow-up compliance activities. A report form for scheduled/unscheduled on-site inspections is used during the inspection to document industry information, historical information, and the inspector's observations (see Appendix 6-C).

#### **6.4.2 Wastewater Sampling**

The City may perform sampling of an industrial user's wastewater discharge in conjunction with inspections or as a separate activity. The purpose of sampling is to evaluate compliance with applicable effluent and local limits. The frequency of sampling depends on the industrial user's compliance record and potential to impact the POTW, among other factors; however, sampling is performed at least once per year with the City's goal to conduct sampling twice per year.

The wastewater samples must be analyzed for the parameters identified in the IWDP by an environmental laboratory licensed by the State of Arizona. All sampling and analysis is conducted in accordance with 40 CFR Part 136. To conduct wastewater sampling of the Industrial user's discharge, the City:

- Follows specific method requirements for sample volumes, container types, and preservation requirements<sup>1</sup>. See Table II – Required Containers, Preservation Techniques, and Holding Times at pages 11236 to 11238 (and associated footnotes) of the Federal Register / Vol. 72, No. 47 / Monday, March 12, 2007
- Identifies samples with the outfall identification listed on the IWDP form, both on sample container labels and on Chain-of-Custody forms
- Places sample containers for chemical analysis in ice-filled coolers immediately following collection and keep samples at less than or equal to 6 degrees Celsius prior to and during transport to the analytical laboratory.
- Packages sample containers to avoid breakage during transport
- Maintains possession of the samples until the samples are submitted to the laboratory under Chain-of-Custody forms, which document unique sample identification, date and time of sample collection, sample matrix, analytical parameters requested, number of containers per sample, and sampler's contact information and signature

Upon receiving the sample cooler, the analytical laboratory verifies custody and the condition of the samples. The laboratory notifies the City of any sample non-conformances (e.g., broken sample containers or improper preservation).

The following table will be used as guidance in determining the sample collection frequency completed by the City from all permitted industrial users whether they are a significant industrial user, or a non-domestic user. The permitted user will be required to install a sample point<sup>2</sup> with both a primary device such as a flume, weir, etc.,) and a secondary device to record the volume of wastewater being discharged. The sample point shall be as close to the right of way as possible that will allow free access to the City to collect samples for the determination of local limits compliance. In those instances where the user conducts a categorically regulated process the sample location for determination with the applicable categorical standard will be at the end of the categorical process and prior to the introduction of other non-categorically regulated wastestreams. This is in addition to the local limit compliance point.

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<sup>1</sup> Consideration should be giving to obtaining pre-preserved sample containers from the contract laboratory whenever possible to decrease the handling of acids, caustics and other preservation chemicals. Proper PPE shall be worn at all times when preparing, collecting, and submitting samples to the laboratory for analysis.

<sup>2</sup> The City should develop a list of "preferred" equipment that the IU would be required to install for flow monitoring and flow proportional sampling. Time composite sampling should only be used when no other option exists. Investment in higher quality equipment will only benefit the City in future master planning activities.

Minimum Flow (gpd)	Maximum Flow (gpd)	Sample Frequency
0	4,999	2 single day sample events per year
5,000	9,999	3 single day sample events per year
10,000	24,999	2 times per year collect 3 consecutive twenty-four (24) hour composites collected flow proportionally
25,000	49,999	3 times per year collect 3 consecutive twenty-four (24) hour composites collected flow proportionally
50,000 or more		4 times per year collect 4 consecutive twenty-four (24) hour composites collected flow proportionally

## 6.5. Data Management

The City of Buckeye has purchased a single user license of Linko Technology, Inc. The Linko software is an industry standard for pretreatment programs nationwide. The data structure will house all IU data from initial survey through sample collection data including all City collected IU analytical results, IU self-monitoring data, permit related, and enforcement documentation which can be electronically stored by the assignment of an individual industrial user identification number. Data is either inputted by the Environmental Compliance Officer and/or Water Resources staff or electronically delivered. Linko is compliant with the Cross-Media Electronic Reporting Regulation (CROMERR) which allows industrial user analytical data to be inputted electronically to determine compliance. See page 59848 of the Federal Register / Vol. 70, No. 197 / Thursday, October 13, 2005. As stated in the CROMERR fact sheet these requirements provide the legal framework for electronic reporting to the Environmental Protection Agency (EPA) and states, tribes, and local governments that are authorized to administer EPA programs. See previous comment at paragraph 3 of Section 6.3.

### 6.5.1 City Responsibilities

The Pretreatment Program generates a potentially cumbersome amount of information and data. The City's Environmental Compliance Officer is responsible for establishing data management procedures to maintain the program. The Environmental Compliance Officer

maintains a file for general Pretreatment Program information as well as files for each individual non-domestic user issued an IWDP. Information filed for the Pretreatment Program may consist of:

- Wastewater Treatment Plant (WWTP) permits for all City of Buckeye plants (AZPDES, APP, etc.)
- Copy of the Pretreatment Program approved by the Arizona Department of Environmental Quality (ADEQ)
- Industrial Wastewater Survey (e.g., Master IU List and Questionnaires) which is coded and stored in Linko
- Legal authority (Initial and any updated Ordinances)
- Copy of local limits studies and updates
- Sample Collection Procedures<sup>3</sup>
- Annual reports
- Standard Operating Procedures
- Job Hazard Analysis (when applicable)
- Miscellaneous information

Information and data stored for each individual industrial user may include:

- Activity Log documenting access to the file by individual initials and date accessed
- Permit application, IWDP, and Fact Sheet
- Baseline and self-monitoring compliance reports
- Oversight monitoring reports (e.g., Site Inspection Reports and analytical reports from sampling events)
- Documentation of enforcement activities (e.g., Warning Notices and Notice of Violations)
- Administrative orders
- Correspondence

In managing data and tracking compliance, the Environmental Compliance Officer follows the guidance set forth in Chapter 8 of the Arizona Department of Environmental Quality (ADEQ) *Pretreatment Procedures and Guidance Manual* (ADEQ 2004).

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<sup>3</sup> The City will follow the US EPA Region 4 Science and Ecosystem Support Division's Wastewater Sampling Operating Procedure Number SESDPROC-306 R3, dated 2/21/13. Appendix 6-D

## **6.5.2 Industrial User Responsibilities**

Permitted Industrial users must keep records of information obtained through monitoring and make them available for inspection and copying by the City. Per Article 16-13-13 of the Code, industrial users must retain, and make available for inspection and copying, all records of information obtained from required and independently conducted monitoring activities as well as documentation associated with best management practices. The records must remain available for a period of at least three years. The period is automatically extended for litigation, and also may be extended by the Environmental Compliance Officer.

CITY OF BUCKEYE

# Section 7 – Enforcement Response Plan

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PRETREATMENT PROGRAM SUBMITTAL

FINAL

July 01, 2021



## Table of Contents

<b>7. Enforcement</b>	<b>1</b>
7.1. Background .....	1
7.2. Authorities .....	1
7.3. Identifying Noncompliance .....	2
7.4. Enforcement Criteria and Actions .....	2
7.5. Personnel .....	3

## List of Appendices

Appendix 7-A Enforcement Response Plan

## 7. Enforcement

### 7.1. Background

The National Pretreatment Program outlined in the Code of Federal Regulations (CFR), 40 CFR 403, at 403.8(f)(5) requires all Publicly Owned Treatment Works (POTW) with approved Pretreatment Programs to develop and implement an Enforcement Response Plan (ERP). The POTW is required to develop a plan that, at a minimum:

- Describes how the POTW will investigate instances of noncompliance;
- Describes the types of escalating enforcement responses the POTW will take in response to all anticipated types of industrial user violations and the time periods within which responses will take place.
- Identifies (by title) the official(s) responsible for each type of response;
- Adequately reflects the POTWs primary responsibility to enforce all applicable pretreatment requirements and standards;

### 7.2. Authorities

Effective on May 06, 2021, the revised Chapter 16 Sewer Utilities and Use of Public Sewers (SUO) authorizes enforcement of the Pretreatment Program by addressing noncompliance in a comprehensive manner. These enforcement responses range from simple notifications to termination of service and grant the department the ability to seek civil or criminal action.

- Article 16-17 authorizes Administrative Actions including:
  - Notification of Violation
  - Consent Orders
  - Show Cause Hearing
  - Compliance Orders
  - Cease and Desist Orders
  - Emergency Suspensions
  - Termination of Discharge
- Article 16-18 authorizes the WRD to seek court actions including:
  - Injunctive Relief
  - Civil Penalties in an amount up to \$25,000 per day
  - Criminal Prosecution including penalties up to \$2,500 per day

- Article 16-19 provides for Supplemental Enforcement Actions including:
  - Administrative fine of \$100 per day for late reporting

### **7.3. Identifying Noncompliance**

Noncompliance with requirements of the Pretreatment Program is identified from various sources of information gathered through implementation of the program. Such sources include but are not limited to:

- On-site inspections of Industrial Users (IUs)
- City compliance monitoring of an IU's discharge
- Review of self-monitoring reports submitted by permitted IUs

Compliance monitoring and self-monitoring reports submitted for each IU are reviewed within 5 days of receipt of the data. These reports are examined to determine if they have been submitted on time, are complete for all required parameters and if any violations of permit limits or the SUO have occurred. Compliance schedule milestones and other due dates for reports are also tracked monthly. Noncompliance is categorized in one of three levels as described in the ERP:

- Random Violation
- Pattern Violation
- Significant Noncompliance

### **7.4. Enforcement Criteria and Actions**

An Enforcement Response Guide (ERG) is included in the ERP and provides a systematic method to determine appropriate responses to violations and noncompliant situations. Its use is intended to achieve equitable enforcement actions for various anticipated violations.

#### **Criteria**

Although the ERG is to be utilized to help determine specific responses to various types of violations, important aspects surrounding the violations should be considered prior to enforcement. These criteria, fully explained in the ERP, are:

- Magnitude of the Violation(s)
- Duration of the Violation
- Effect on the Environment
- Effect on the POTW
- Compliance History of the User

- Economic Benefit to User
- Good Faith of the User

### **Actions**

Using the enforcement criteria in section 7.3.1 the ERG is then used to determine the most appropriate response in addressing the noncompliance. Those responses available through the SUO, described fully in the ERP, are as follows:

- Notice of Violation (NOV)
- Administrative Order (AO)
  - Cease and Desist Order
  - Consent Order
  - Compliance Order
  - Show-Cause Order
- Administrative Fines
- Civil
- Criminal Prosecution
- Emergency Suspension of Service
- Termination of Service

## **7.5. Personnel**

The Pretreatment Program's overall administrative operation is carried out by the Water Resources Director (WRD) of the Department. The WRD's main duties include supervision of operations and personnel at the water and wastewater treatment plants, the distribution and collection systems for both facilities and oversight of the Buckeye Pretreatment Program. Wherever the WRD is called for or cited in the ERP, it shall be understood to include any Department employee designated by the WRD to serve in an enforcement or oversight capacity under the WRD's direction.

To assist the WRD in administering the Pretreatment Program, an Environmental Compliance Officer (ECO) has been designated. As the WRD's designated representative, the ECO is authorized to initiate specific enforcement proceedings as needed to protect the POTW, the environment and the health and welfare of the general public.

The WRD and ECO have access to legal assistance for any legal services needed in enforcement proceedings. This attorney would advise the ECO on proper enforcement actions and develop any judicial actions deemed necessary by the WRD and/or the ECO.

CITY OF BUCKEYE, ARIZONA

# Section 8 - Resources

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PRETREATMENT PROGRAM SUBMITTAL

FINAL

7/1/2021



## Table of Contents

<b>8. Resources</b>	<b>1</b>
8.1 Background .....	1
8.2 Organization and Staffing .....	2
8.3 Program Costs .....	3
8.4 Financing Sources and Cost Recovery Systems.....	5

## List of Appendices

- Appendix 8-A Water Resources Department Organization Chart
- Appendix 8-B Job Descriptions
- Appendix 8-C Training Matrix
- Appendix 8-D Labor Cost Estimates



## 8. Resources

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### 8.1 Background

POTWs are required to have sufficient resources and qualified personnel to carry out the authorities and procedures detailed in 40 Code of Federal Regulations (CFR) 403.8 (f)(3). General pretreatment program responsibilities include:

- Identifying and locating all possible Industrial Users (IUs) which might be subject to the POTW pretreatment program
- Identifying the character and volume of pollutants contributed to the POTW by identified IUs
- Notifying identified IUs of applicable pretreatment standards and other pertinent requirements of the Clean Water Act and Resource Conservation and Recovery Act
- Receiving and analyzing self-monitoring reports and other notices submitted by IUs in accordance with self-monitoring requirements
- Randomly sampling and analyzing the effluent from IUs and conduct surveillance activities in order to identify, independent of information supplied by IUs, occasional and continuing noncompliance with pretreatment standards, including, at a minimum, annual sampling of the effluent from each significant industrial user (SIU)
- Evaluating whether each SIU needs a plan or other action to control slug discharges
- Investigating instances of noncompliance with pretreatment standards and requirements
- Complying with public participation requirements

This chapter describes the City of Buckeye's (City's) plan to carry out these responsibilities. The following sections discuss the City's Pretreatment Program organization and staffing, costs, and funding.

## 8.2 Organization and Staffing

The City’s Pretreatment Program is a part of the Water Resources Department (Appendix 8-A). Table 8-1 shows the role of each staff member associated with the Program, primary responsibilities, and the level of effort required from each staff position. Descriptions of staff qualifications are summarized in Appendix 8-B. The City provides training for its employees as shown in Appendix 8-C.

It is estimated that the total level of effort required to develop and implement the City’s Pretreatment Program is equivalent to 1.32 person-years in the first three years of the program and 1.10 person-years in subsequent years (See Appendix 8-D).

<b>Staff Position</b>	<b>Role</b>	<b>Primary Responsibilities</b>	<b>Estimated Level of Effort</b>
Water Resources Director	Program administration	<ul style="list-style-type: none"> <li><input type="checkbox"/> Ensure fair and consistent program implementation</li> <li><input type="checkbox"/> Provide oversight of Water Resources Manager</li> <li><input type="checkbox"/> Participate in enforcement procedures as outlined in Enforcement Response Plan (ERP)</li> </ul>	1%
City Attorney	Legal assistance	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide support and advice to Water Resources Director, Water Resources Manager, Environmental Compliance Officer in interpretation of Pretreatment Program</li> <li><input type="checkbox"/> Participate in enforcement procedures as outlined in ERP</li> </ul>	3% first 3 years, 1% in subsequent years
Senior Civil Engineer	Program administration/ Technical assistance	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide engineering support and advice to Water Resources Director and Water Resources Manager</li> <li><input type="checkbox"/> Works with Environmental Compliance Officer to issue SIU permits</li> <li><input type="checkbox"/> Works with Environmental Compliance Officer to issue non-SIU permits</li> </ul>	5% in first 3 years, 2% in subsequent years
Water Resources Manager	Program administration	<ul style="list-style-type: none"> <li><input type="checkbox"/> Oversee program development</li> <li><input type="checkbox"/> Ensure fair and consistent program implementation</li> <li><input type="checkbox"/> Provide oversight of program financing and accounting, personnel, and public participation</li> <li><input type="checkbox"/> Provide oversight of Environmental Compliance Officer</li> <li><input type="checkbox"/> Participate in enforcement procedures</li> <li><input type="checkbox"/> Provide oversight of sampling and analysis of IU discharges and of POTW influent, effluent, and sludge</li> </ul>	35% in first 3 years, 18% in subsequent years

City Clerk	Program administration	<input type="checkbox"/> Assist Water Resources Director in complying with public notice requirements	0.5%
Environmental Compliance Officer	Program implementation	<input type="checkbox"/> Conduct and update Industrial Waste Survey (IWS) <input type="checkbox"/> Review SIU permit applications and baseline monitoring reports (BMRs) <input type="checkbox"/> Review non-SIU permit applications and issue non-SIU permits <input type="checkbox"/> Review compliance schedule reports and self-monitoring reports and investigate IU non-compliance <input type="checkbox"/> Communicate with IUs <input type="checkbox"/> Conduct periodic inspections of SIUs to ensure compliance with Permits, Orders, and Compliance Schedules. <input type="checkbox"/> Evaluate the need for Slug Control at all IUs <input type="checkbox"/> Manage data, keep records, and prepare pretreatment reports <input type="checkbox"/> Participate in enforcement procedures as outlined in the ERP	80%
Contract Laboratory	Laboratory analysis	<input type="checkbox"/> Provide sampling assistance and analytical services required by program	-
Marketing and Communications Manager	Public Outreach	<input type="checkbox"/> Provide assistance to Environmental Compliance Officer in public outreach and education of IUs <input type="checkbox"/> Assist in creating brochures and flyers	5%
GIS Administrator	Program Implementation	<input type="checkbox"/> Provide assistance to Environmental Compliance Officer in creating maps illustrating collections systems to identify IUs	1%
Tax Auditor/ Business Licensing	Permitting	<input type="checkbox"/> Provide new businesses licenses to Environmental Compliance Officer for industrial survey	1%
Permit Technician III	Permitting	<input type="checkbox"/> Routes construction documents and plans for industrial permits to Environmental Compliance Officer for review	1%

### 8.3 Program Costs

Costs are associated with specific elements of the City's Pretreatment Program, as follows:

- Labor of City employees associated directly with the Pretreatment Program, as well as those providing technical and legal assistance, and assisting with program administration

- Procurement, operation, and maintenance of sampling and analytical equipment
- Procurement and licensing of pretreatment software
- Sampling and monitoring/laboratory analysis
- Professional Services for pretreatment program training

The estimated annual program costs during the first year is \$186,309 and the next two years approximately \$161,309. Estimated subsequent-year annual program costs are approximately \$132,206. Summaries of estimated annual costs in the first three years and in subsequent years are presented in Table 8-2.

Item	First Year	Next Two Years	After First Three Years
Labor	\$146,309	\$146,309	\$117,206
Equipment O&M	\$5,000	\$5,000	\$5,000
Software	\$20,000	\$5,000	\$5,000
Laboratory Services	\$5,000	\$5,000	\$5,000
Professional Services	\$10,000	\$0	\$0
<b>Total</b>	<b>\$186,309</b>	<b>\$161,309</b>	<b>\$132,206</b>

### 8.3.1 Labor

The roles of City staff in implementing the City's Pretreatment Program are summarized in Table 8-1. Annual costs for each position were estimated by taking the midpoint salary, adding a 30% benefit cost, and applying the estimated level of effort from the Table 8-1. The total estimated annual program costs for labor are approximately \$146,309 in the first three years and \$117,206 in subsequent years.

### 8.3.2 Sampling and Monitoring/Laboratory Analysis

Sampling and monitoring are conducted by the Environmental Compliance Officer with support from the City's Water Resource Department, Wastewater Treatment staff.

Laboratory analyses are conducted by the Contract Laboratory. The budgeted annual cost of contracted laboratory services is approximately \$5,000.

### **8.3.3 Sampling and Analytical Equipment**

The City owns or will obtain or access to the following sampling equipment:

- Vehicle with two-way communication
- Gas detector capable of monitoring Lower Explosion Level (LEL), sulfide, and oxygen
- 2 portable samplers with bottles
- 2 portable pH meters
- 1 portable flow meter
- Grab sample collection and storage containers
- Coolers and reagents for sample preservation
- Safety equipment, including equipment for confined space entry
- Miscellaneous tools and equipment

The estimated total annual cost of maintaining equipment, based on five percent of the estimated purchase of equipment, plus annual planned replacement and operating supplies is approximately \$5,000. The Contract Laboratory owns and maintains all equipment necessary to conduct wastewater and sludge/biosolids analyses in accordance with 40 CFR Part 136.

## **8.4 Financing Sources and Cost Recovery Systems**

The City's Code of Ordinances at Chapter 16, Article 16-7, Sewer Service Charges provides a system to fund the overall operation of the Water Resources Department.

- Article 16-7-1 establishes a User Charge Formula based upon the flow and strength of sewage discharged
- Article 16-7-2 establishes a system for the determination of Wastewater Quantity
- Article 16-7-3 establishes a system for the determination of Wastewater Quality
- Article 16-7-4 creates biennial review of the user charge system
- Article 16-7-5C provides for the billing of customers to cover the cost of industrial wastewater services.

CITY OF BUCKEYE, ARIZONA

# Section 9 – Public Participation and Confidentiality

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PRETREATMENT PROGRAM SUBMITTAL

FINAL

7/1/2021



## Table of Contents

<b>9. Public Participation and Confidentiality</b>	<b>1</b>
9.1. Public Participation .....	1
9.2. Confidentiality.....	2



## 9. Public Participation and Confidentiality

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This chapter of the City of Buckeye (City) Pretreatment Program describes the requirements for public participation and confidentiality described in the General Pretreatment Regulations, Title 40 Code of Federal Regulations (CFR) Part 403, and Chapter 16 of the City Code, Sewer Utilities and Use of Public Sewers. The City, as the Control Authority, is responsible for communicating or making available a variety of information to the public. Other requirements are carried out by Arizona Department of Environmental Quality (ADEQ) as the Approval Authority. Regulations governing confidentiality allows the City to hold confidential certain types of information provided by industrial users (IUs).

### 9.1. Public Participation

#### 9.1.1 Control Authority Responsibilities

**Significant Non-Compliance:** In accordance with the requirements at 40 CFR 403.8(f)(2)(viii), the City annually provides notice to the public of all Industrial Users that during the previous 12 months were in significant noncompliance (SNC), as defined at Article 16-16-1 of the SUO. The public notices are placed in a newspaper of general circulation within the jurisdictions served by the City's publicly owned treatment works (POTW).

**Industrial Waste Survey:** All users that introduce pollutants into the POTW from any nondomestic source (as regulated under Section 307(b), (c), or (d) of the Clean Water Act, are considered IUs. Periodically, the City requests that all IUs participate in an industrial wastewater survey (IWS) to update the master list of non-domestic dischargers to the City's POTW (SUO Article 16-11-1). To identify significant industrial users (SIUs) and other IUs with the potential to discharge wastewater that might adversely affect the POTW, the City collects information through preliminary survey forms completed by all industrial, commercial, and institutional wastewater dischargers. If the information obtained in the preliminary survey indicates that a discharger may be an IU, or the information is insufficient to make a determination, the City may request additional information to characterize the IU's processes, operations, and wastewater generation and discharge.

**Local Limits:** Periodically the City may update its local industrial pretreatment limitations (local limits), as set forth in SUO Article 16-9-3. Federal regulations require that affected persons and groups be notified and given an opportunity to respond before final promulgation, per 40 CFR 403.5(c)(3). The City notifies individually affected users and other parties that have expressed interest at the start of detailed reevaluations and when new limits are drafted.

**Civil Penalties:** In accordance with A.R.S. 49-391, before a consent decree filed with superior court or before a negotiated settlement becomes final, the City will provide a period of thirty days for public comment by publishing a notice in a newspaper of general circulation within the jurisdictions served by the City's publicly owned treatment works (POTW).

**IU Records Availability:** Information and data obtained by the City about IUs from reports, surveys, wastewater discharge applications and permits, monitoring programs, and inspection and sampling activities associated with the Pretreatment Program, including effluent data as defined by 40 CFR 2.302, are available to the public without restriction, per 40 CFR 403.14(b), except for trade secrets or trade processes, as discussed below in Section 9.2.

### **9.1.2 Approval Authority Responsibilities**

The City notifies the Approval Authority and requests program modification approval before implementing any significant change in the operation of the Pretreatment Program. Upon notification, the Approval Authority issues public notice of the request for a modification. The Approval Authority also issues public notice of the decision if comments are received in response to the initial public notice, or if the request is approved with changes.

## **9.2. Confidentiality**

Part of the City's responsibility in establishing good rapport and open communication with IUs requires an assurance that it will maintain confidentiality on data, procedures, or methods of production that are trade secrets or secret processes, as described in 40 CFR 403.8(f)(1)(vii). An IU may request that the WRD hold confidential specific information if the IU can demonstrate that its release would divulge information, processes, or methods of production entitled to protection under state law (SUO Article 16-15-1).

### **9.2.2 Procedures**

All records containing confidential business information (see 40 CFR 403.14) will be handled by the WRD or designee as follows:

1. The IU file will note that confidential business information (CBI) is a part of the IU's record, and that the particular CBI is maintained elsewhere.
2. The CBI will be labeled as "Confidential Business Information".
3. The individual CBI will be maintained in a locked file drawer, cabinet, or other secure location.
4. A log will be maintained in the location containing all CBIs which indicates the dates, times names of any person or persons accessing the information.

All information or data concerning IUs in the City's possession, including confidential business information, are subject to retention and disclosure under the Arizona Public Records Law, A.R.S. 39-121 et seq., or may be required to be produced under order of a court of competent jurisdiction.