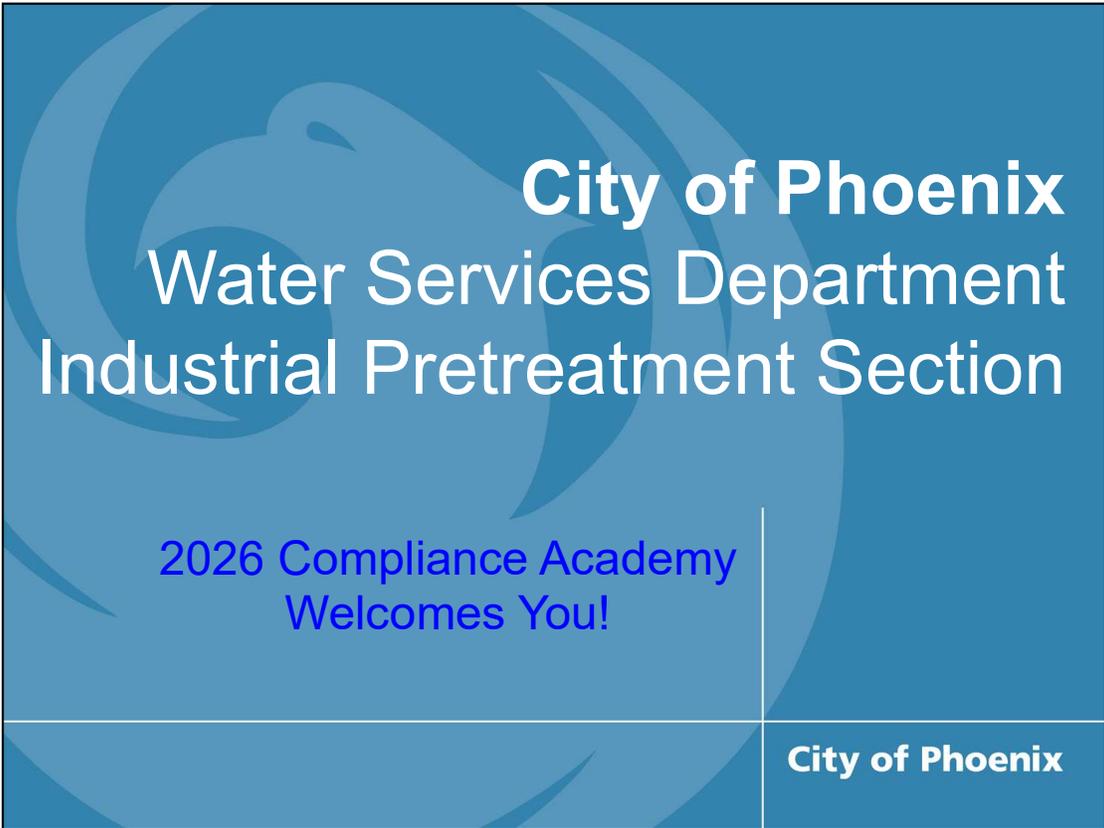


**CITY OF PHOENIX  
INDUSTRIAL PRETREATMENT  
COMPLIANCE ACADEMY**



**Wastewater Compliance Sampling**

The logo features a stylized, circular graphic in shades of blue, resembling a water droplet or a wave, set against a darker blue background. The text is overlaid on this graphic.

# City of Phoenix Water Services Department Industrial Pretreatment Section

2026 Compliance Academy  
Welcomes You!

City of Phoenix

For those of you joining us online, please put your name and company affiliation in the chat box.

# Wastewater Compliance Sampling Class

**Your Instructors:**  
Christie O'Day  
Elyse Uribe



City of Phoenix

Notes:

**JOIN US FOR THE NEXT CLASS:**

**Laboratory Analytical Issues**

**Thursday, May 21, 2026**

**Virtual Class – 8:00 a.m.**

*Request class registration  
using our website:*

<https://www.phoenix.gov/ippcompacademy>

**City of Phoenix**

Registration is from April 24 to May 21 using the website link  
<https://www.phoenix.gov/ippcompacademy>

**In-person attendees:**

- **Phones**
- **Restrooms**
- **Chlorine or Fire Alarms**
- **Coffee and water**
- **Smoking**

**House Rules** | **City of Phoenix**

1. Please set your cell phones to Silent/ Vibrate and take important phone calls in the hallway or adjacent room.
2. Restrooms are: Out of this room (your left my right) and make a left → Go to the end of the hallway → Make a left and then a quick right: the Ladies' Room will be on your right and the Mens' Room is about 30 feet further on the left.
3. ALARMS:
  - a) In case of a Fire Alarm, please pack all of your belongings and follow the instructor to the Assembly Area and you will be given further instructions.
  - b) In case of a Chlorine Alarm, please pack all of your belongings and follow the instructor to the Assembly Area. IF instructed to evacuate please consider the class over.
4. Coffee and water are available in the Break area: Out of this room, make a left → Last door on left before the end of the hallway.
5. The Smoking Area is just outside to your right (my left) on the patio.



# Syllabus

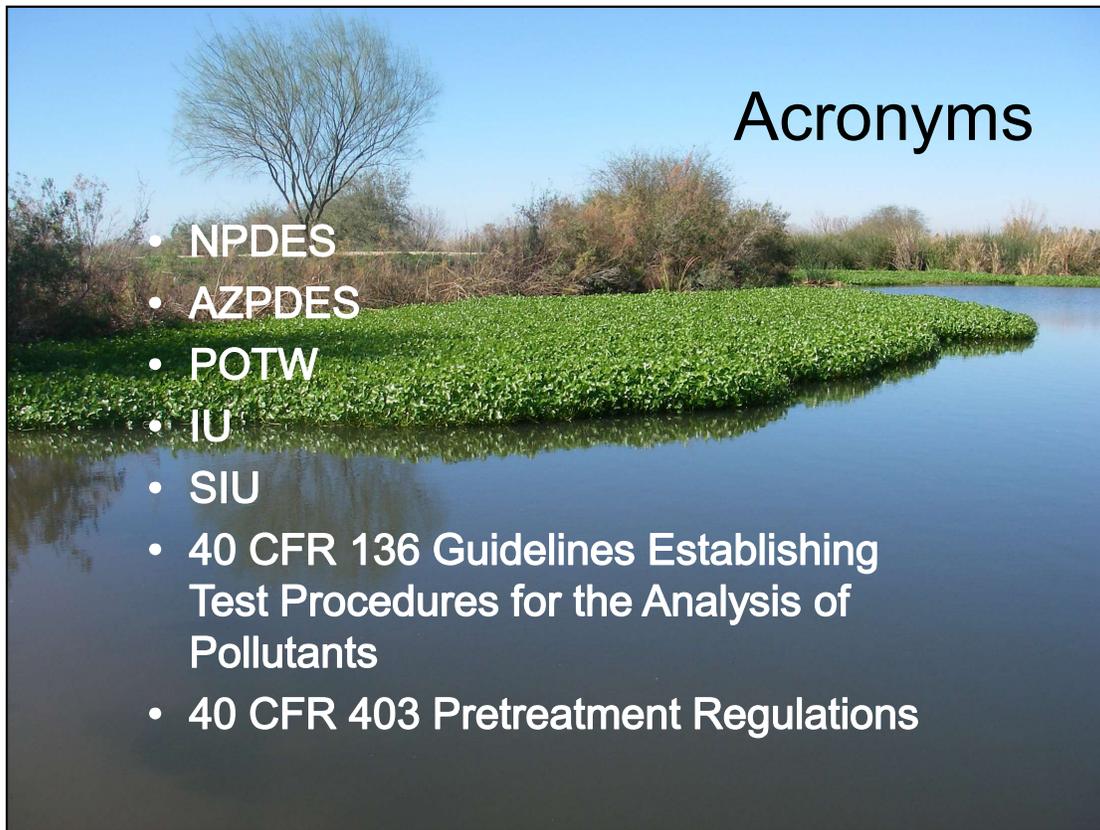
- Common Acronyms
- Purpose of Compliance Sampling
- Components of a Compliance Sampling Point
- Water Balance Diagram
- Flow Measurement Devices
- Sample Preservation
- Break

Notes:



# Syllabus

- Sampling Methodology & Analytical Methods
- Chain of Custody (COC)
- Self-Monitoring Report Forms (SMR)
- Split Sample Policy
- Quiz



- NPDES – National Pollutant Discharge Elimination System (City permit for 91<sup>st</sup> Avenue POTW)
- AZPDES - Arizona Pollutant Discharge Elimination System (City permit) for 23<sup>rd</sup> Avenue POTW
- POTW - A Publicly Owned Treatment Works is a term used in the United States for a sewage treatment plant (owned by the public) and includes all of the infrastructure that feeds into the POTW from the sewer shed.
- IU – Industrial User – A source of indirect discharge, other than a normal domestic user (this is you!)
- SIU – Significant Industrial User – All users subject to categorical pretreatment standards under 40 Code of Federal Regulations. Also any user that discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater), contributes a process waste stream which makes up 5% or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant, or designation as such on the basis that it has a reasonable potential for adversely affecting the POTW's operation.
- 40 CFR 136 - GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS UNDER THE CLEAN WATER ACT (Quiz #7)
- 40 CFR 403 – GENERAL PRETREATMENT REGULATIONS FOR EXISTING AND NEW SOURCES OF POLLUTION

**You can find Definitions for pretreatment terms at 40 CFR 403.3 and also in the City of Phoenix's Sewer Code.**

# Pretreatment Program Goals

## 40 CFR 403.2

### Objectives of the Pretreatment Program

- (a) To prevent the introduction of pollutants into POTWs which will interfere with the operation of a POTW, including interference with its use or disposal of municipal sludge;
- (b) To prevent the introduction of pollutants into POTWs which will pass through the treatment works or otherwise be incompatible with such works; and
- (c) To improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges.

**Purpose of Sampling**

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The City of the Phoenix Pretreatment Program is a requirement of both the 23<sup>rd</sup> Ave WWTP's AZPDES permit and the 91<sup>st</sup> Ave WWTP's NPDES permit.

## Purpose of Sampling

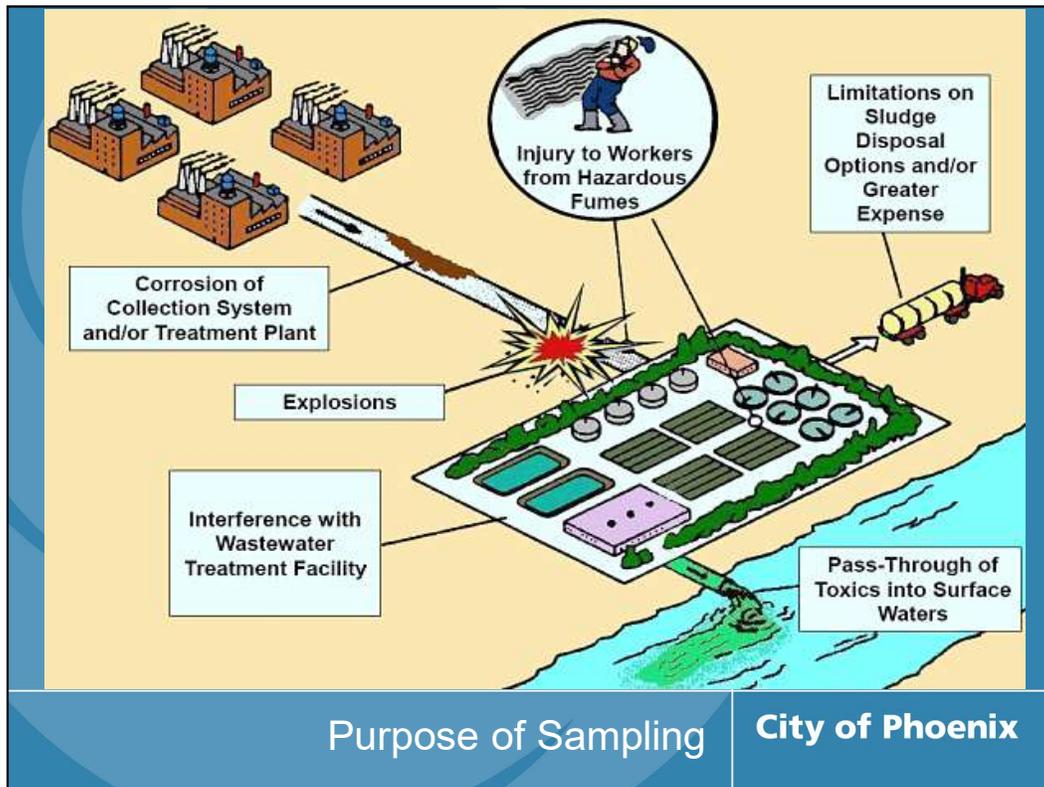


- **To Verify Compliance**
- **To Gather Information and Data**
- **To Determine Impact of Pollutants**

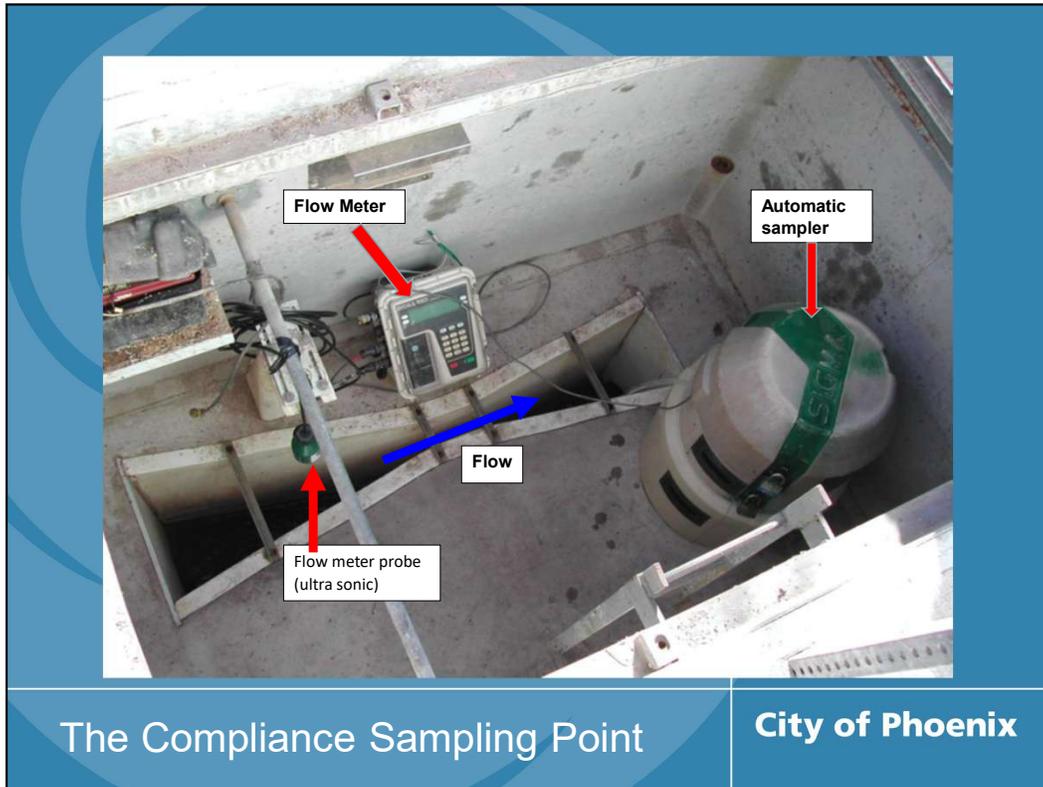
**City of Phoenix**

Wastewater Sampling helps....

- Determine impact of industrial waste on the POTW.
- Verify the quality of self-monitoring data.
- Verify that the sampling location specified in the permit is adequate.
- Determine compliance with effluent limitations and permit conditions.
- Provide a basis for enforcement proceedings in the event such proceedings become necessary.
- Determine characteristics of the wastewater and if an industrial wastewater permit would be required for a potential permittee.



- This is a generalized process flow of industrial wastewater into a POTW or Wastewater Treatment Plant and the shows some of the associated risks of improperly pretreated waterwater.
- Corrosion of the Collection system may occur due to low pH wastewater or build up of Fats, Oils, and Grease (FOG).
- Explosions may occur due to the build up of explosive gases such as Hydrogen Sulfide (H<sub>2</sub>S) in the Collection System. Even if not ignited, these gases are an inhalant risk to sewer workers.
- Interference with Wastewater Treatment can be caused by high Total Suspended Solids (TSS) or low Dissolved Oxygen conditions which are more costly to treat and adversely affect normal operations.
- Certain contaminants may not be affected by water treatment and cause pass-through of toxic chemicals that in turn may cause the City to violate our own permits. Additionally, excess heavy metals may concentrate in the sewage sludge and limit the City's options for disposal.



An IU's compliance sampling point may be a manhole, petcock, valve, sampling port, open-channel flow device, or other waste plumbing appurtenance specifically designated by the Director for monitoring wastewater flows and for collection of samples for determination of compliance with effluent limitations.

A compliance sample can only be collected at the Compliance Sampling Point (CSP) (Quiz #1).

## Flow Measurement Systems

Any flow measurement system can be considered to consist of two distinct parts:

- a **primary device**, and
- a **secondary device**

Each device has a separate function to perform:

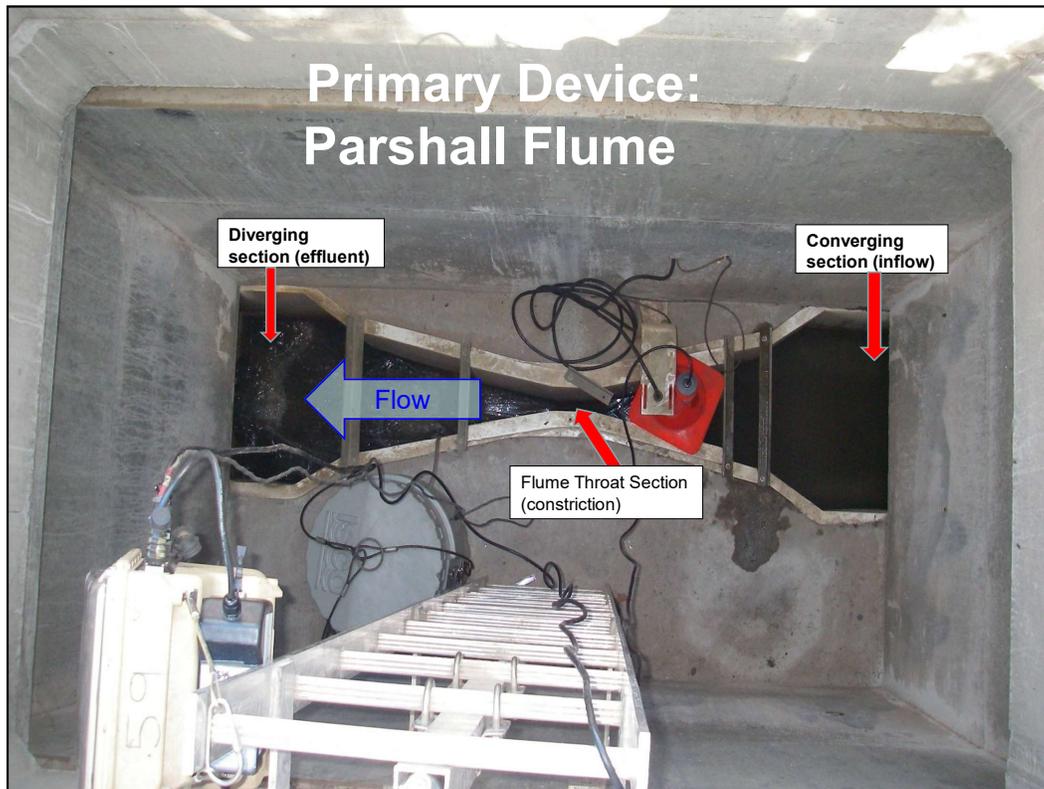
- The flow passes through the primary device in a continuous, uninterrupted stream
- The secondary device uses that information to determine the quantity of flow per unit time

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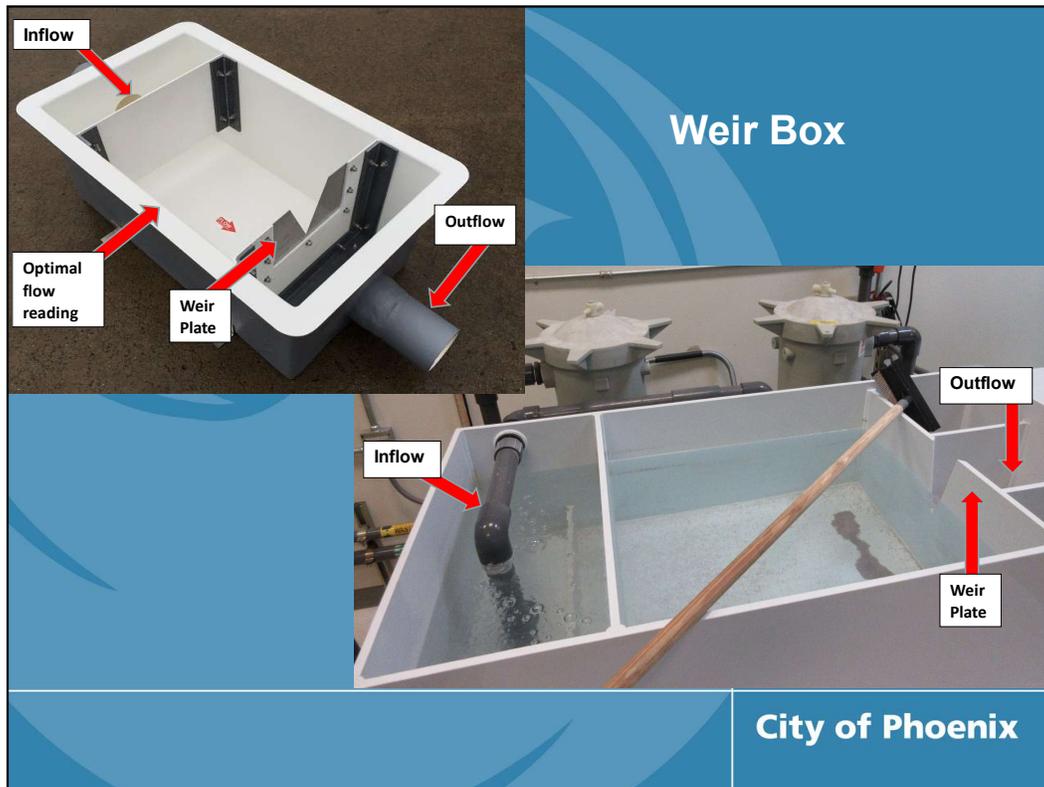
There are usually two distinct parts of any flow measurement system, especially when you consider a traditional open channel flow setup.

Primary devices are physical devices set in the flow stream with the purpose of monitoring said flow stream.

Secondary devices aid the user in quantifying the flows within the primary device.



- Weirs and Flumes are the most common primary flow measurement devices.
- These devices are hydraulic structures installed in the flow stream, which create a geometric relationship between flowrate and depth of flow.
- A weir or a flume (primary device) restricts the flow in a controlled manner and generates a liquid level which is related to the flow rate through the device. The flow meter (secondary device) measures this level and converts it into a corresponding flow rate according to the known liquid level of the primary device.
- Sometimes a facility will only have a primary flow measurement device – an example is a batch tank with demarcations for volume (flow is relatively accurately estimated)
- Rarely, a primary device will be the flow meter itself (usually a flow meter is secondary). For example, a sampling box/chamber that cannot measure flow (only used for sample collection) but has an ultrasonic flow meter upstream for flow measurement (the flow meter would be the primary device in this case as it's the only thing able to measure flow)



A weir box contains a weir plate at the end which contains a notch in the shape of the letter 'V' (V-notch). The plate creates "head pressure" in the middle partition to allow for accurate flow reading. Optimal flow is measured 2/3 distance back from weir plate.

- The design is simple and easy to use, allowing for consistent flow measurements.
- Very useful for low-flow applications.
- A clean device will give the most accurate flow measurement.



Flow Measurement – Secondary Devices

Flow Meter

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City of Phoenix currently uses the Sigma 950 Flow Meter when sampling Industrial Users or Automatic Samplers with built-in flow meters.

We also utilize IU flow meters when conducive to the sampling point setup, i.e. use of a laser flow meter and straight pipe with cabling provided, if circumstances allow.

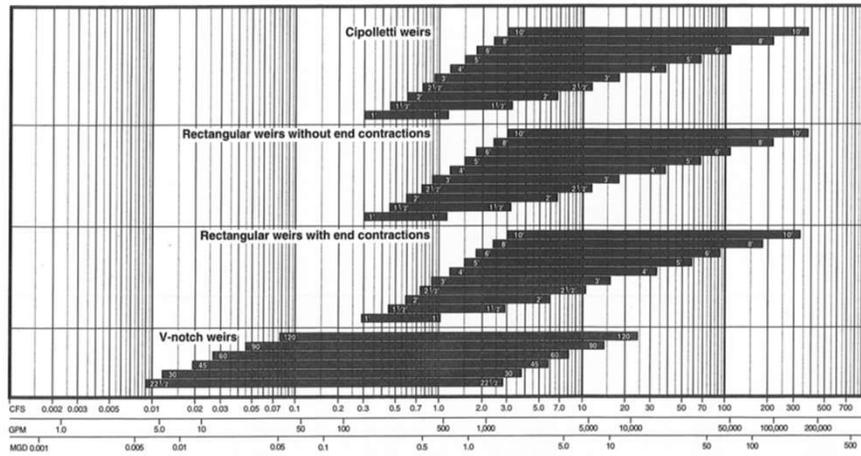
A flow meter is an instrument for monitoring , measuring, recording and/or calculating the level, rate of flow, pressure, or discharge of liquids (wastewater).

**Typical secondary flow meter devices:**

- Measure level with a sensor
- Convert level to flow rate
- Display and record data

## Flow Rate Ranges for Weirs

Table 5-3 A: Useful Flow Rate Range of Various Types of Weirs in Feet



Gallons Per Minute: Range from 4.0  
GPM to 175,000 GPM

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### Reference:

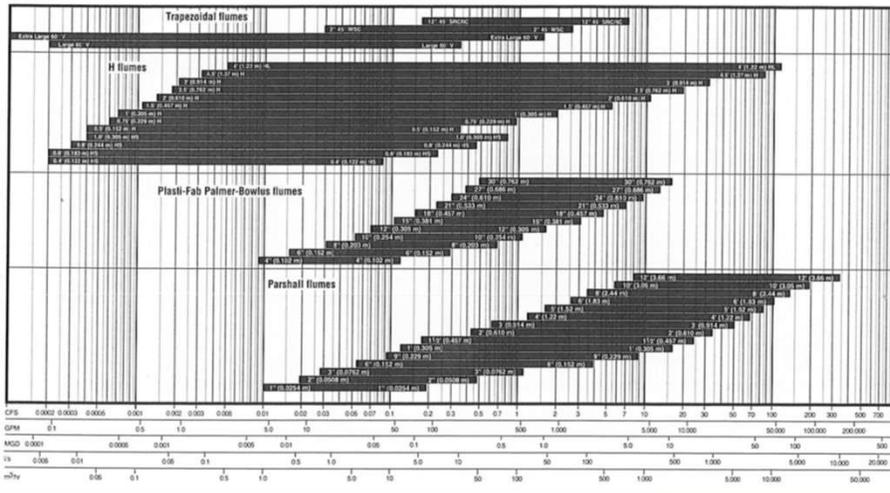
Teledyne Isco Open Channel Flow Measurement Handbook, Fifth Edition, by Douglas M. Gant and Brian D. Dawson, page 124.

When installing a Compliance Sampling Point, it is important to match your estimated flow rate with the proper device.

V-notch weir boxes are great choices for IUs with low process flow volumes and low TSS.

# Flow Rate Ranges for Flumes

Table 5-4: Useful Flow Rate Range of Various Types of Flumes



Gallons Per Minute: Range from 0.1  
GPM to 155,000 GPM

City of Phoenix

## Reference:

Teledyne Isco Open Channel Flow Measurement Handbook, Fifth edition, by Douglas M. Gant and Brian D. Dawson, page 126.

- Parshall flumes are some of the most common but have a very defined or limited flow range.
- Trapezoidal flumes offer the widest low flow range.
- H flumes can handle sudden large discharges like those at industrial laundries.

**Table 13-1:**  
1 in. Parshall Flume Discharge Table with Head in Feet

Formulas: CFS = 0.3380 H<sup>1.550</sup> MGD = 0.2184 H<sup>1.550</sup>  
GPM = 151.7 H<sup>1.550</sup>  
Where: H = head in feet

Head (feet)	CFS	GPM	MGD	Head (feet)	CFS	GPM	MGD
0.01				0.36	0.0694	31.14	0.0448
0.02				0.27	0.0724	32.49	0.0468
0.03				0.38	0.0754	33.86	0.0487
0.04				0.39	0.0785	35.25	0.0507
0.05				0.40	0.0817	36.66	0.0528
0.06				0.41	0.0849	38.09	0.0548
0.07				0.42	0.0881	39.54	0.0569
0.08				0.43	0.0914	41.01	0.0590
0.09				0.44	0.0947	42.49	0.0612
0.10	0.0096	4.275	0.0062	0.45	0.0980	44.00	0.0633
0.11	0.0110	4.99	0.0071	0.46	0.1014	45.53	0.0655
0.12	0.0126	5.672	0.0082	0.47	0.1049	47.07	0.0678
0.13	0.0143	6.421	0.0092	0.48	0.1084	48.63	0.0700
0.14	0.0160	7.203	0.0104	0.49	0.1119	50.21	0.0723
0.15	0.0179	8.015	0.0115	0.50	0.1154	51.81	0.0746
0.16	0.0197	8.859	0.0128	0.51	0.1190	53.42	0.0769
0.17	0.0217	9.732	0.0140	0.52	0.1227	55.05	0.0793
0.18	0.0237	10.63	0.0153	0.53	0.1263	56.70	0.0816
0.19	0.0258	11.56	0.0166	0.54	0.1301	58.37	0.0840
0.20	0.0279	12.52	0.0180	0.55	0.1339	60.05	0.0865
0.21	0.0301	13.50	0.0194	0.56	0.1376	61.76	0.0889
0.22	0.0323	14.51	0.0209	0.57	0.1414	63.47	0.0914
0.23	0.0346	15.55	0.0224	0.58	0.1453	65.21	0.0939
0.24	0.0370	16.61	0.0239	0.59	0.1492	66.96	0.0964
0.25	0.0394	17.69	0.0255	0.60	0.1531	68.73	0.0989
0.26	0.0419	18.80	0.0271	0.61	0.1571	70.51	0.1015
0.27	0.0444	19.93	0.0287	0.62	0.1611	72.31	0.1041
0.28	0.0470	21.09	0.0304	0.63	0.1652	74.12	0.1067
0.29	0.0496	22.27	0.0321	0.64	0.1692	75.96	0.1094
0.30	0.0523	23.47	0.0338	0.65	0.1734	77.80	0.1120
0.31	0.0550	24.69	0.0356	0.66	0.1775	79.67	0.1147
0.32	0.0578	25.94	0.0373	0.67	0.1817	81.55	0.1174
0.33	0.0606	27.21	0.0392	0.68	0.1859	83.44	0.1201
0.34	0.0635	28.50	0.0410	0.69	0.1902	85.34	0.1229
0.35	0.0664	29.81	0.0429	0.70	0.1945	87.27	0.1256

**Begins at 4 Gallons Per Minute  
Up to 87 Gallons Per Minute**

**Table 13-2:**  
2 in. Parshall Flume Discharge Table with Head in Feet

Formulas: CFS = 0.6760 H<sup>1.550</sup> MGD = 0.4369 H<sup>1.550</sup>  
GPM = 303.4 H<sup>1.550</sup>  
Where: H = head in feet

Head (feet)	CFS	GPM	MGD	Head (feet)	CFS	GPM	MGD
0.01				0.41	0.1037	76.18	0.1097
0.02				0.42	0.1162	79.68	0.1139
0.03				0.43	0.1287	82.01	0.1181
0.04				0.44	0.1394	84.99	0.1224
0.05				0.45	0.1491	88.00	0.1267
0.06				0.46	0.2029	91.05	0.1311
0.07				0.47	0.2097	94.14	0.1356
0.08				0.48	0.2167	97.26	0.1401
0.09				0.49	0.2237	100.4	0.1446
0.10	0.0191	8.551	0.0123	0.50	0.2309	103.6	0.1492
0.11	0.0221	9.912	0.0143	0.51	0.2381	106.8	0.1539
0.12	0.0253	11.34	0.0163	0.52	0.2453	110.1	0.1586
0.13	0.0286	12.84	0.0185	0.53	0.2527	113.4	0.1633
0.14	0.0321	14.41	0.0207	0.54	0.2601	116.7	0.1681
0.15	0.0357	16.03	0.0231	0.55	0.2676	120.1	0.1730
0.16	0.0395	17.72	0.0255	0.56	0.2752	123.5	0.1779
0.17	0.0434	19.46	0.0280	0.57	0.2828	126.9	0.1828
0.18	0.0474	21.27	0.0306	0.58	0.2906	130.4	0.1878
0.19	0.0515	23.13	0.0333	0.59	0.2984	133.9	0.1928
0.20	0.0558	25.04	0.0361	0.60	0.3063	137.5	0.1979
0.21	0.0602	27.01	0.0389	0.61	0.3142	141.0	0.2031
0.22	0.0647	29.02	0.0418	0.62	0.3222	144.6	0.2083
0.23	0.0693	31.10	0.0448	0.63	0.3303	148.2	0.2135
0.24	0.0740	33.22	0.0478	0.64	0.3385	151.9	0.2188
0.25	0.0788	35.39	0.0510	0.65	0.3467	155.6	0.2241
0.26	0.0838	37.60	0.0541	0.66	0.3550	159.3	0.2294
0.27	0.0888	39.87	0.0574	0.67	0.3634	163.1	0.2349
0.28	0.0940	42.18	0.0607	0.68	0.3718	166.9	0.2403
0.29	0.0992	44.54	0.0641	0.69	0.3803	170.7	0.2458
0.30	0.1045	46.94	0.0676	0.70	0.3889	174.5	0.2514
0.31	0.1100	49.39	0.0711	0.71	0.3976	178.4	0.2569
0.32	0.1156	51.88	0.0747	0.72	0.4063	182.3	0.2626
0.33	0.1212	54.41	0.0784	0.73	0.4150	186.3	0.2682
0.34	0.1270	56.99	0.0821	0.74	0.4239	190.3	0.2740
0.35	0.1328	59.61	0.0858	0.75	0.4328	194.2	0.2797
0.36	0.1387	62.27	0.0897	0.76	0.4418	198.3	0.2855
0.37	0.1448	64.97	0.0936	0.77	0.4508	202.3	0.2914
0.38	0.1509	67.71	0.0975	0.78	0.4599	206.4	0.2973
0.39	0.1571	70.50	0.1015	0.79	0.4691	210.5	0.3032
0.40	0.1634	73.22	0.1056	0.80	0.4783	214.7	0.3092

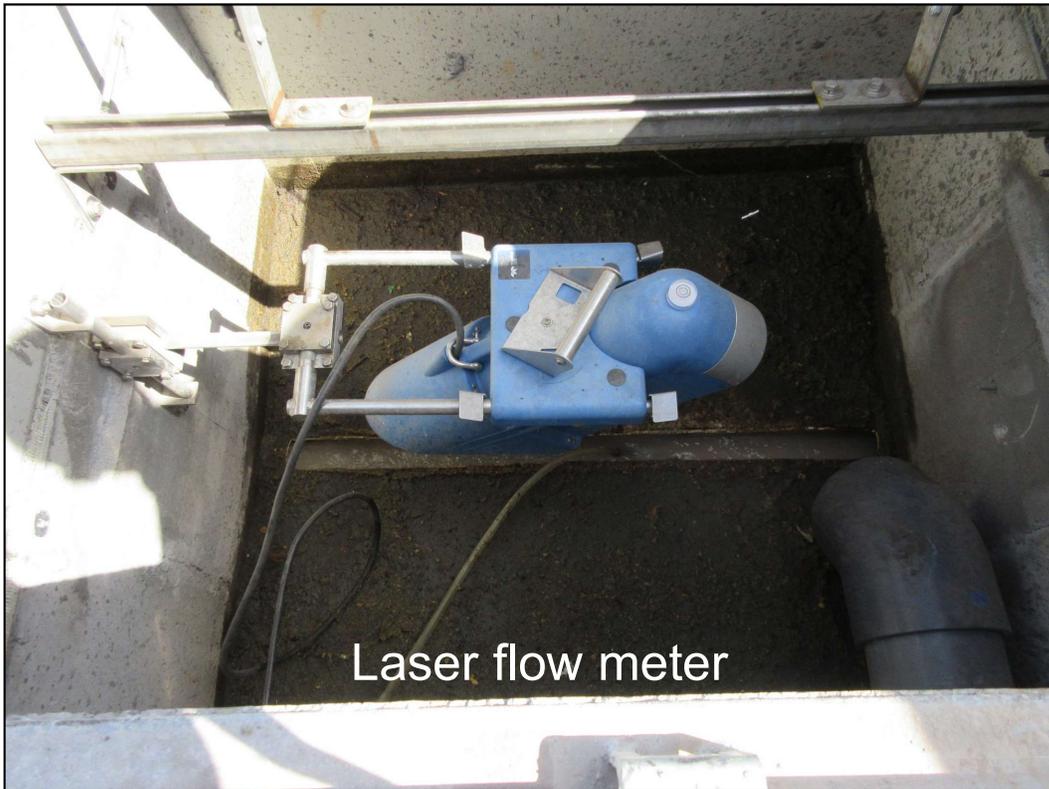
**Flow Rate Table Example**

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These are the discharge tables for a 1 inch and a 2-inch Parshall Flume. The compliance measuring device must match your discharge range. For example, if you have a 1-inch flume, your flow cannot exceed 87 GPM or you would be exceeding the capacity of the device, which means your flow measurements would not be accurate.

**Reference:**

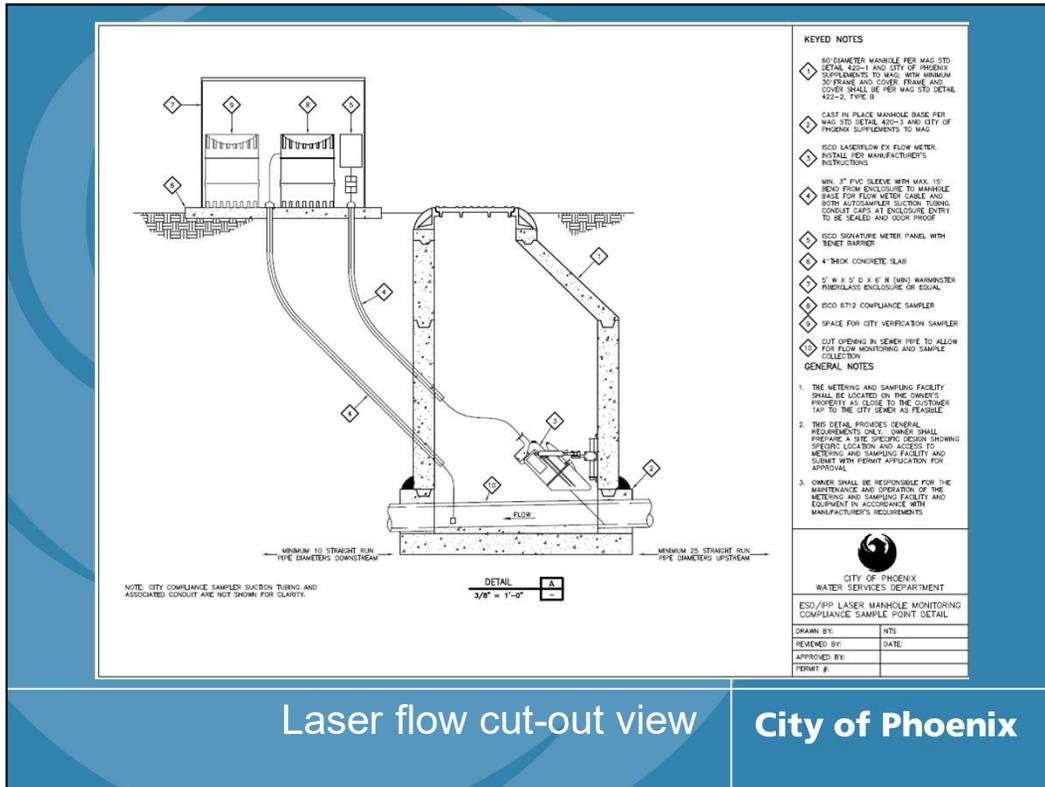
Teledyne Isco Open Channel Flow Measurement Handbook, Fifth Edition, by Douglas M. Gant and Brian D. Dawson, pages 314-315.



This is the Teledyne ISCO **LaserFlow® Velocity Sensor**

The LaserFlow® velocity sensor remotely measures flow in open channels with [non-contact Laser Doppler Velocity](#) technology and non-contact Ultrasonic Level technology. The sensor uses advanced technology to measure velocity with a laser beam at single or multiple points below the surface of the wastewater stream.

This would be considered a primary device (even though it's a flow meter) as installations with this sensor are not compatible in an open channel (flume, weir) and flow measurement is dependent on the sensor (not the open pipe).



Laser flow cut-out view

City of Phoenix

This cut sheet is provided by the City to industries looking to install a laser flow meter in their system



Here an example of the equipment set up needed in conjunction with a laser flow meter. This "dog house" is installed adjacent to the laser meter vault/manhole.



Here an example of a typical batch tank with demarcations on the side to enable measurement of flow and representative sample collection.

City policy (and EPA guidance) allows for the collection of a single grab sample from an homogenous batch IF AND ONLY IF the batch tank is mixed throughout the entire discharge period AND the sample is collected at the mid-point of the discharge period for the batch, e.g., a 300-gallon batch is mixing throughout the discharge period and a grab sample is collected at the point when 150 gallons of the batch has discharged and 150 gallons remains to be discharged.

**Allowed Discharges**

Wastewater generated from the following sources is allowed for discharge into the City of Phoenix sanitary sewer under the conditions of this permit and Chapter 28 of the Phoenix City Code.

*Sanitary Wastes  
Boiler Blowdown*

**Discharge Limits and Sampling (Monitoring) Requirements**

- Effluent limits and sampling for the Permittee apply at Compliance Sampling Point № 30385.01, described as the 22.5' V-North Weir Box located at the North end of the equipment room on the southwest side of the building.
- Wastewater generated from the following sources result in discharge through Compliance Sampling Point № 30385.01:  
*Refurbishment of Semi-conductor equipment  
Chemical Mechanical Polishing and wafer polishing services  
Acid Fume scrubber operations  
1.31% Dilution from the refurbishing shop*
- Permittee must limit and sample the allowed discharges of the sources specified above in accordance with the table below; wherein the most stringent of the limits apply as indicated in bold, and wherein all parameters are "Totals" limited in concentration.
- The sampling frequency shown is the minimum required; Permittee may sample more often than required, but must report the results of any extra samples collected.
- Discharges through the compliance sampling point average 10,000 gallons per day and are not expected to exceed 20,000 gallons during any single day.
- Wastewater generated from the categorical process operations are subject to the Federal 469.18 Regulations.

Parameter	Units	Minimum Sampling Frequency	Sampling Method	Daily Minimum		Daily Maximum			
				FINAL Limit	Local Limit	FINAL Limit	CWF Limit	PSNS Limit	Local Limit
Arsenic	mg/L	1 per Quarter	Composite	-	-	<b>0.13</b>	-	-	0.13
BOD	mg/L	1 per Quarter	Composite	-	-	-	-	-	-
Cadmium	mg/L	1 per 6-Months	Composite	-	-	<b>0.047</b>	-	-	0.047
Copper	mg/L	1 per Quarter	Composite	-	-	<b>1.5</b>	-	-	1.5
Cyanide	mg/L	1 per 6-Months	Grab	-	-	<b>1.20</b>	-	-	2.0
Lead	mg/L	1 per Quarter	Composite	-	-	<b>0.41</b>	-	-	0.41
Mercury	mg/L	1 per 6-Months	Composite	-	-	<b>0.0023</b>	-	-	0.0023
Molybdenum *	mg/L	1 per 6-Months	Composite	-	-	-	-	-	-
pH*	S.U.	1 per Week	Grab	<b>5.0</b>	5.0	<b>10.5</b>	-	-	10.5
Selenium	mg/L	1 per 6-Months	Composite	-	-	<b>0.10</b>	-	-	0.10
Silver	mg/L	1 per 6-Months	Composite	-	-	<b>0.43</b>	-	-	1.2
TSS	mg/L	1 per Quarter	Composite	-	-	-	-	-	-
TTO - 469*	mg/L	1 per 6-Months	Composite	-	-	<b>1.35</b>	1.35	1.37	-
Zinc	mg/L	1 per 6-Months	Composite	-	-	<b>2.61</b>	-	-	3.5

Compliance Sampling Point is documented in the Permit

City of Phoenix

Please note that a compliance sample can only be collected at the compliance sampling point.

## Permit Parameters Table

Table 1. Permit Limits

Parameter	Units	Minimum Sampling Frequency	Sampling Method	Daily Minimum			Daily Maximum			Monthly Average			
				FINAL Limit	PSNS <sup>1</sup> Limit	Local Limit	FINAL Limit	PSNS Limit	CWF <sup>2</sup> Limit	Local Limit	FINAL Limit	PSNS Limit	CWF Limit
Arsenic	mg/L	1 per 6 Months	Composite	-	-	-	<b>0.13</b>	-	-	0.13	-	-	-
BOD <sup>3</sup>	mg/L	1 per Quarter	Composite	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	1 per 6 Months	Composite	-	-	-	<b>0.047</b>	0.11	0.092	0.047	<b>0.06</b>	0.07	0.059
Chromium	mg/L	1 per 6 Months	Composite	-	-	-	<b>2.32</b>	2.77	2.32	-	<b>1.43</b>	1.71	1.43
Copper	mg/L	1 per Quarter	Composite	-	-	-	<b>1.5</b>	3.38	2.83	1.5	<b>1.74</b>	2.07	1.74
Cyanide (T)	mg/L	1 per 6 months	Grab	-	-	-	<b>1.08</b>	1.2	1.08	2.0	<b>0.54</b>	0.65	0.545
Lead	mg/L	1 per Quarter	Composite	-	-	-	<b>0.41</b>	0.69	0.579	0.41	<b>0.36</b>	0.43	0.361
Mercury	mg/L	1 per 6 Months	Composite	-	-	-	<b>0.0023</b>	-	-	0.0023	-	-	-
Molybdenum <sup>4</sup>	mg/L	1 per Quarter	Composite	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	1 per 6 Months	Composite	-	-	-	<b>3.34</b>	3.98	3.34	-	<b>2.0</b>	2.38	2.00
pH <sup>4</sup>	SU	1 per Week	Grab	<b>5.0</b>	5.0	5.0	<b>10.5</b>	-	-	10.5	-	-	-
Selenium	mg/L	1 per 6 Months	Composite	-	-	-	<b>0.10</b>	-	-	0.10	-	-	-
Silver	mg/L	1 per 6 Months	Composite	-	-	-	<b>0.36</b>	0.43	0.361	1.2	<b>0.20</b>	0.24	0.201
TSS <sup>5</sup>	mg/L	1 per Quarter	Composite	-	-	-	-	-	-	-	-	-	-
TTO 433 <sup>*</sup>	µg/L	1 per 6 Months	Composite	-	-	-	<b>1786</b>	2130	1786	-	-	-	-
Zinc	mg/L	1 per 6 Months	Composite	-	-	-	<b>2.19</b>	2.61	2.19	3.5	<b>1.24</b>	1.48	1.24

1. PSNS – Pretreatment Standards for New Sources  
 2. CWF – Combined Waste Formula  
 3. BOD – Biological Oxygen Demand  
 4. See Sampling and Analysis Notes for Additional Information  
 5. TSS – Total Suspended Solids

Taken from page 2 or 3 of permit

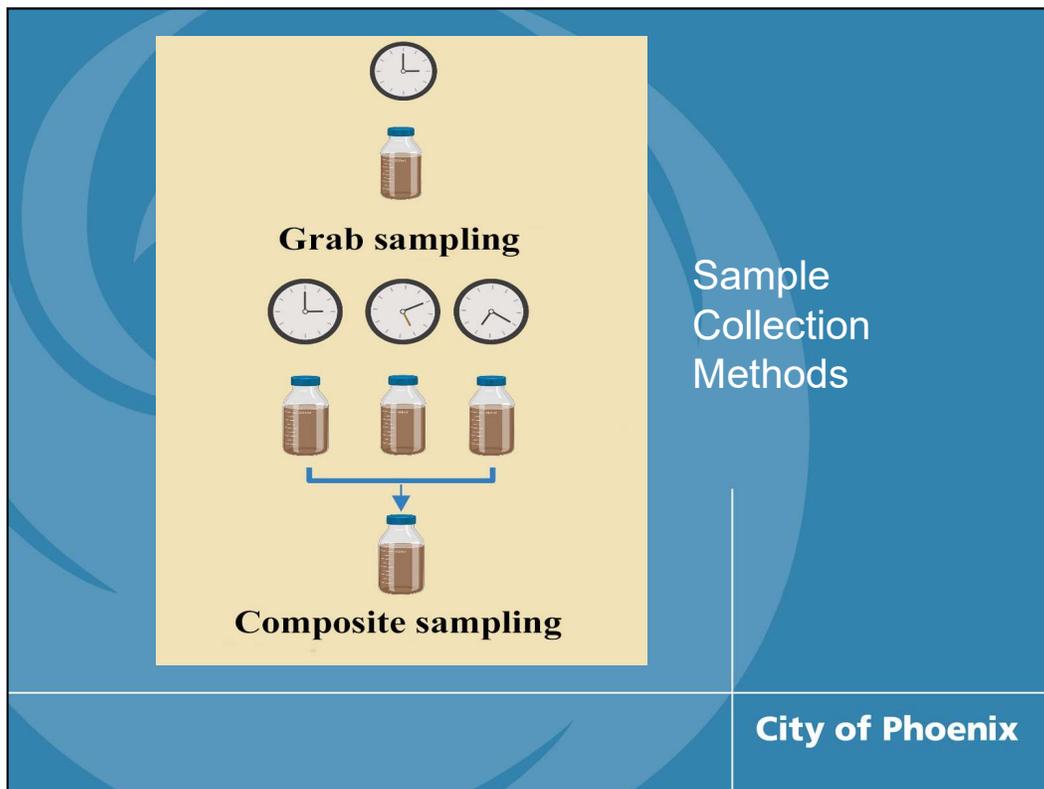
City of Phoenix

Parameter limits, sampling frequencies, and sample collection methods are identified in the Permit.

- Parameters represent the required sampling – this will include Local Limits as defined the City’s Sewer Code (Chapter 28) and any required categorical limits.
- Sampling frequency is how often you may be required to sample each parameter.
- Sampling method specifies whether the parameter must be collected as a composite sample or a grab sample

pH is usually collected weekly, which means the pH should be collected at least once during a calendar week between Sunday to Saturday.

See 40 CFR 136 for approved lab analysis methods for your industry.

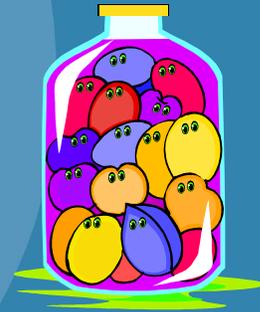


Wastewater samples are typically collected either by directly filling the sample container, as in a grab sample, or by using an automatic sampler or other device to composite the sample using multiple aliquots.

## Composite Sample

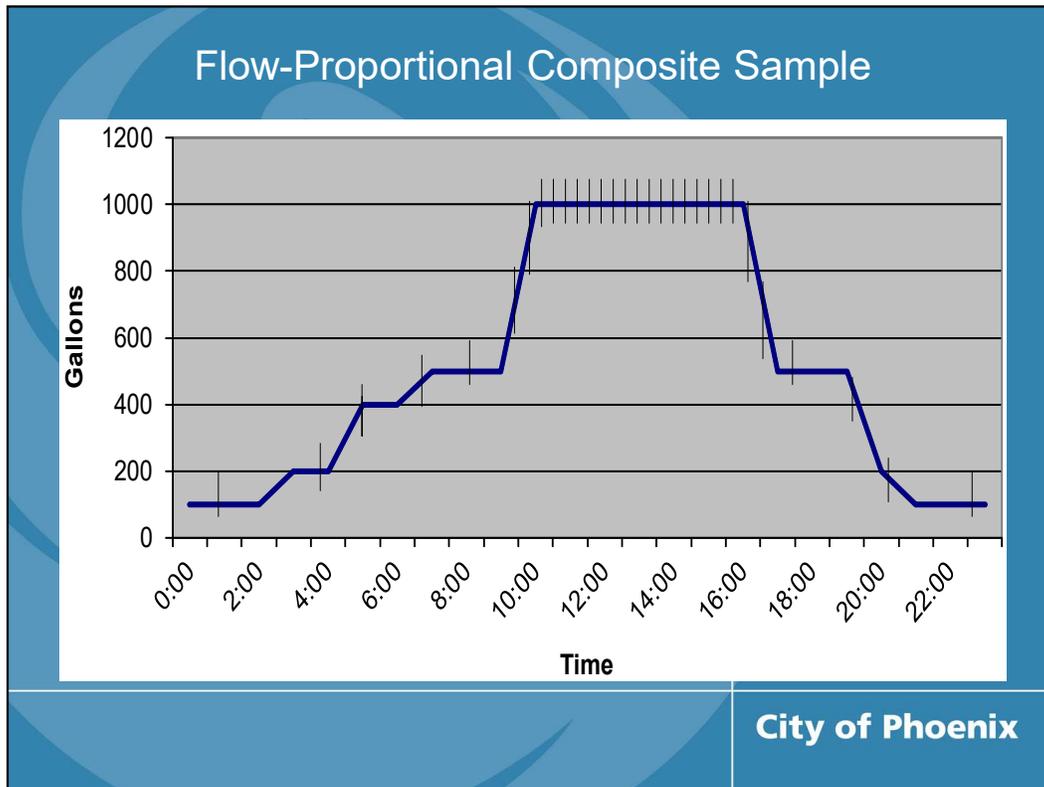
A series of wastewater samples taken over a given period of time (usually 24 hours, process flow day, or batch) and weighted by flow rate.

- BOD/COD/TSS
- Fluoride
- Semi Volatile Organics
- Metals



City of Phoenix

For wastewater monitoring, a composite sample is a sample composed of multiple discrete samples collected over a 24-hour period, process day, or batch discharge (Quiz #2). Ideally a composite sample is collected flow proportionally, where the sample aliquot increases proportional to the flow rate of the discharge. A composite sample can also be collected at equal time intervals.



Black dashes represent individual sample aliquots. Samples must be representative of the WW discharge.

**Flow-proportional composite sample:**

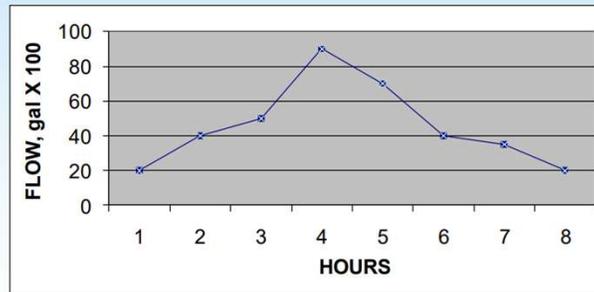
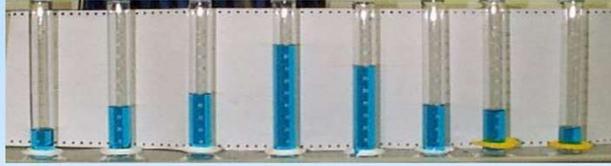
A sample consisting of a series of aliquots (equal portions of the sample) in which each aliquot is collected after the passage of a defined volume of discharge.

The ideal representative sample is collected flow proportionally. (Quiz #3)

**Representative sample is defined as...**

A sample from a wastestream that is identical or nearly identical in composition to the larger wastewater being discharged, and is typical of the discharge from the facility on a normal operating day.

## Time Weighted Sampling



City of Phoenix

A Time Weighted Sample is another example of composite sampling where the aliquot of sample is collected at a set time interval over a process day. This might apply when performing a manual hand composite sample (for some batch dischargers) or sampling a site where the average flow volume is unknown and/or varies widely like at a hospital.



Grab Sample

City of Phoenix

This photo demonstrates a City of Phoenix employee collecting a grab sample from an H flume. All collection containers are triple rinsed with deionized water.

## Grab Sample

- The EPA defined a grab sample as an individual discrete sample collected over a period of time not exceeding 15 minutes.
- The grab sample should be representative of the wastewater conditions at the time of sample collection:
  - pH
  - Cyanide
  - Volatile Organic Compounds (VOC's)
  - Temperature
  - Oil and grease

City of Phoenix

A grab sample is a snapshot in time. The sample must be collected and **processed or preserved within 15 minutes** of the collection time.

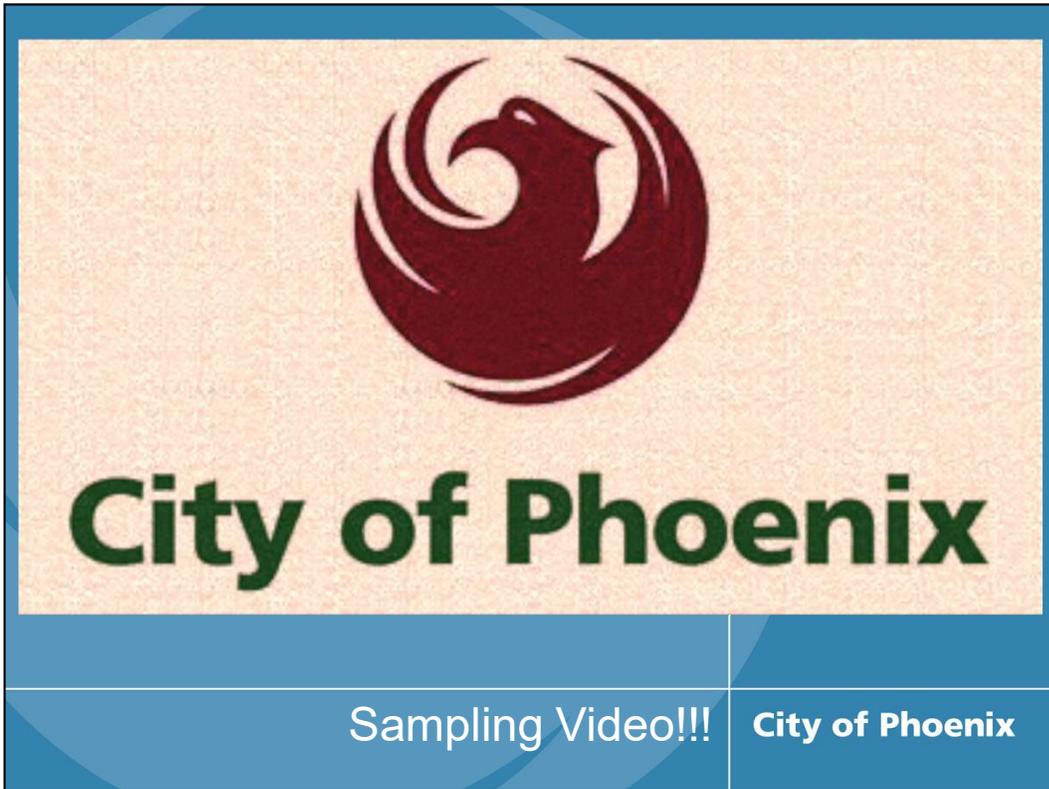
## Sample Preservation



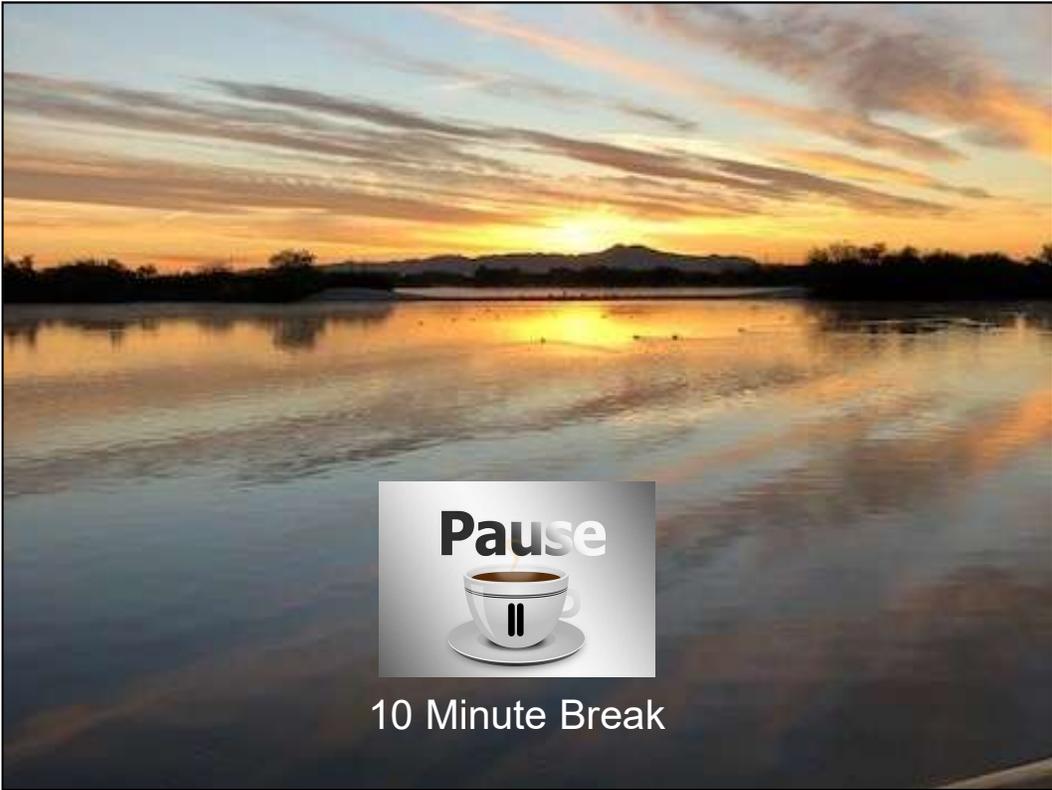
Immediately upon collection, most samples begin to change. Therefore samples must be analyzed immediately or preserved to minimize any changes in the pollutant concentration.

**City of Phoenix**

- Collection of meaningful data demands that before a sample is analyzed, the correct sampling and preservation methods must be used.
- Immediately upon collection, most samples begin to change. Therefore, samples must be analyzed immediately or preserved to minimize any changes in the pollutant concentration.

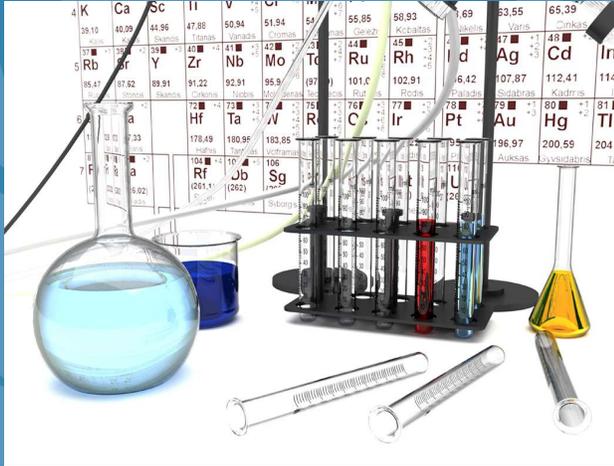


This video demonstrates a City sampling event at one of our IUs, from beginning to end.



Notes:

## Sampling Methodology & Analytical Methods



City of Phoenix

- Standard Permit Conditions Part D (a) of your Wastewater Discharge Permit (Permit) requires the use of “Approved Laboratory Procedures.” The Permit may also restrict the test method and/or require the use of a particular method approved by 40 CFR 136 (such as for Total Copper).
- EPA specifies test methods that are approved for use in wastewater analysis in 40 CFR 136. Tables 1A, 1B, and 1C in Part 136.3 list the various analytical methods that may be used to analyze for a pollutant parameter. Part 136.2(e) allows alternative procedures to be proposed for approval by the EPA.

TABLE II—REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES			
Parameter number/name	Container <sup>1</sup>	Preservation <sup>2 3</sup>	Maximum holding time <sup>4</sup>
<b>Table IA—Bacterial Tests</b>			
1-5. Coliform, total, fecal, and <i>E. coli</i>	PA, G	Cool, <10 °C, 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>5</sup>	8 hours. <sup>22 23</sup>
6. Fecal streptococci	PA, G	Cool, <10 °C, 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>5</sup>	8 hours. <sup>22</sup>
7. Enterococci	PA, G	Cool, <10 °C, 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>5</sup>	8 hours. <sup>22</sup>
8. <i>Salmonella</i>	PA, G	Cool, <10 °C, 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>5</sup>	8 hours. <sup>22</sup>
<b>Table IA—Aquatic Toxicity Tests</b>			
9-12. Toxicity, acute and chronic	P, FP, G	Cool, ≤6 °C <sup>16</sup>	36 hours.
<b>Table IB—Inorganic Tests</b>			
1. Acidity	P, FP, G	Cool, ≤6 °C <sup>18</sup>	14 days.
2. Alkalinity	P, FP, G	Cool, ≤6 °C <sup>18</sup>	14 days.
4. Ammonia	P, FP, G	Cool, ≤6 °C, <sup>18</sup> H <sub>2</sub> SO <sub>4</sub> to pH <2	28 days.
9. Biochemical oxygen demand	P, FP, G	Cool, ≤6 °C <sup>18</sup>	48 hours.
10. Boron	P, FP, or Quartz	HNO <sub>3</sub> to pH <2	6 months.
11. Bromide	P, FP, G	None required	28 days.
14. Biochemical oxygen demand, carbonaceous	P, FP, G	Cool, ≤6 °C <sup>18</sup>	48 hours.
15. Chemical oxygen demand	P, FP, G	Cool, ≤6 °C, <sup>18</sup> H <sub>2</sub> SO <sub>4</sub> to pH <2	28 days.

Examples of Collection and Preservation Methods

City of Phoenix

This table is taken from 40 CFR 136.3: Identification of test procedures can be found at <https://www.ecfr.gov/current/title-40/section-136.3>.

Table II identifies the required containers, preservation techniques, and **holding time** for specific parameters. (Quiz #4)

<b>Parameter</b>	<b>EPA Methods</b>	<b>Standard Methods</b>
pH S.U.	4500-H + B-2000	D1293-99 (A or B)
Copper (T) mg/l	220.2	3113-B
	200.7	3120-B
Lead (T) mg/l	200.9	3113-B
	200.7	3120-B
Mercury (T) mg/l	245.1	3112-B
Volatile Organics (i.e. Benzene and Toluene)	602/624	6200-C
<b>Examples of 40 CFR 136 Analytical Methods</b>		<b>City of Phoenix</b>

The standard methods are those adopted by the Arizona Department of Health Service (the organization who accredits environment laboratories for operation in the state).

You can find explanation on all methods on the National Environmental Methods Index web site at [www.nemi.gov](http://www.nemi.gov).

<b>Thermo</b> SCIENTIFIC		90003 0512
CLIENT/SOURCE	<input type="checkbox"/> GRAB	<input type="checkbox"/> COMPOSITE
SITE NAME	DATE/TIME	
SAMPLE #	PRESERVATIVE	
ANALYSIS	COLL. BY	

Sample Label for Bottle      City of Phoenix

**Labels help ensure that you have all the bottles and correct preservatives for the requested analysis.** Your lab may supply you with a pre-ordered bottle kit with a packing list which lists the tests and the sample container type and preservative for each test. The bottles often have corresponding labels.

Bottle labels should be legibly filled out using a permanent marker or preprinted. The label should at minimum have the site ID, date, time, the analysis or test method, and preservative.

Make sure that this information matches the chain of custody form, exactly (especially sample times – remember the importance of holding times).

**Chain of custody** is used in most sampling situations to maintain the integrity of the sample by providing documentation of the control, transfer, and analysis of samples. Chain of custody is especially important in environmental work where sampling can identify the existence of contamination.



Chain of Custody - Definition

City of Phoenix

Now that the sample has been collected...

You must send the sample to an accredited laboratory of your choice for processing.

And for this you'll need a chain of custody!

- Written documents required for all compliance samples
- Show changes in sample possession.
- Show the sample was properly collected and preserved.
- Demonstrate sample integrity.

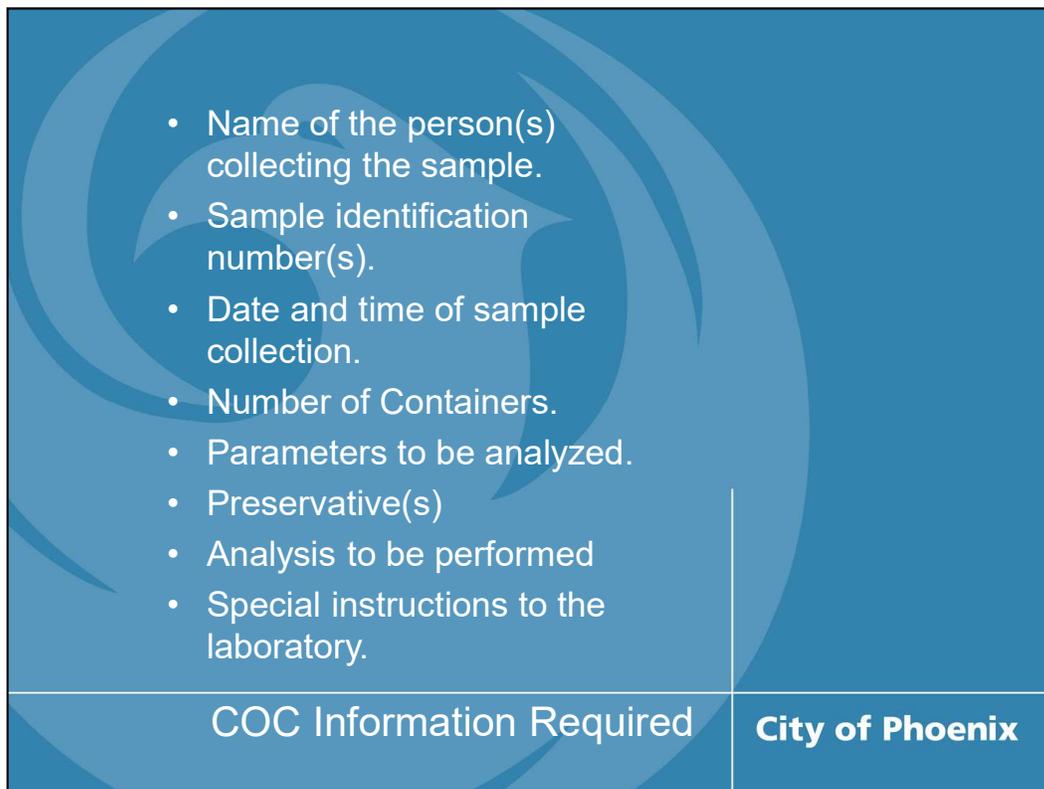
COC – What, Who, Why

**City of Phoenix**

### Chain of Custody (COC) Record

- A. A written LEGAL document that is required for ALL compliance samples.
- B. Shows changes in sample possession - Provides a map of the sample's journey from its collection through its final analysis in the laboratory. Every person who has control of the sample must be included on the Chain-of-Custody Form. When the sample is not in a person's possession it must be secured in a manner that prevents tampering or is recognizable if tampering does occur.
- C. Shows that the sample was properly collected and preserved according to 40 CFR 136 guidelines.
- D. Demonstrates Sample Integrity - Using the COC, following written SOPs, and filling in sampling logs ensures that sample integrity is maintained from sample collection through delivery to the laboratory.

(Quiz # 8)



- Name of the person(s) collecting the sample.
- Sample identification number(s).
- Date and time of sample collection.
- Number of Containers.
- Parameters to be analyzed.
- Preservative(s)
- Analysis to be performed
- Special instructions to the laboratory.

COC Information Required	City of Phoenix
--------------------------	-----------------

Please take the time to make sure your chain-of-custody is correctly filled out and is legible!

According to a notice we received last year from Legend Technical Services, they receive approximately 500-800 samples daily! One of their biggest bottle necks with processing samples in a timely manner is a very large number of discrepancies with samples and chain of custody forms upon receipt. Every discrepancy must be verified and documented, which can be very time-consuming and delays the analysis of your samples.



Sample # 2016014197 Sample ID 21169.04

Barcode: 

### Chain of Custody Report

**City of Phoenix**  
WATER SERVICES DEPARTMENT  
ENVIRONMENTAL SERVICES DIVISION

Sampling Location: 21169.04  
6" Parshall flume

EMSL Use Only  
Index Bottle Lot#: \_\_\_\_\_ Loc Id: 7108 Task Id: 683148 Monitoring Id: 535210 Due Date: 03/03/2016

Preservative Kit #: 47

LIMS Number	Code	Sample ID	Test Requested	Bottle Count	Sample Type	Preservation	Collect Date	Collect Time
<u>14197</u>	<u>A</u>	<u>400237275</u>	<u>Fluoride</u>	<u>1</u>	<u>COMPOSITE</u>		<u>3/16</u>	<u>0952</u>
<u>14198</u>	<u>A</u>	<u>400237276</u>	<u>IPP Group A</u>	<u>1</u>	<u>COMPOSITE</u>			
<u>14199</u>	<u>A</u>	<u>400237277</u>	<u>Metals IPP</u>	<u>1</u>	<u>COMPOSITE</u>	<u>HNO3 pH&lt;2 LICE</u>		<u>↓</u>

Notes to Lab / Comments / Field Data:  
Flow: 150042 GPD - (Flow) pH: 8.4 SU - (Grat)

Sample	Site Code	PACS
2016014197	- 21169.04	- 400237275
2016014198	- 21169.04	- 400237276
2016014199	- 21169.04	- 400237277

REVIEWED  
MAR 18 2016  
by: AC

SAMPLED / RELINQUISHED BY	DATE	RECEIVED TIME	RECEIVED BY	CONDITION
<u>[Signature]</u>	<u>MAR 03 2016</u>	<u>1240</u>	<u>[Signature]</u>	<u>G</u>
		TEMP °C: <u>22</u>		

MON\_COC.rpt: Revised 12/23/2013 3/2/2016 2:09:17PM Page 1 of 1

Chain Of Custody Examples
City of Phoenix

This is an example the City of Phoenix Chain of Custody form for IPP sampling.

**eurofins** | Environment Testing America

### ANALYTICAL REPORT

Eurofins TestAmerica, Phoenix  
4625 East Cotton Ctr Blvd  
Suite 189  
Phoenix, AZ 85040  
Tel: (602)437-3340

Laboratory Job ID: 550-155981-1  
Laboratory Sample Delivery Group: 01082021\_23  
Client Project/Site: 01082021\_23

For:  
RDH Environmental Services LLC  
6007 S 40th St.  
Ste 3  
Phoenix, Arizona 85042

Attn: Robin Smalls

*Rachel Sester*

Authorized for release by:  
1/19/2021 4:04:38 PM

Rachel Sester, Project Manager I  
(602)659-7615  
Rachel.Sester@Eurofinset.com

1  
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14

Lab Report | City of Phoenix

Once the samples have been run, the lab will send a report with a date and time stamp. Please review your report promptly!

The 24-hour clock starts when the lab report is received (Quiz #5).

Also note that we require a legible copy of the COC to be provided with the corresponding lab report when you submit your facility's SMR.

## Self Monitoring Report Forms (SMR)



City of Phoenix

All permitted industries who discharge wastewater into the City of Phoenix's sewers are required to submit a SMR monthly.

Please note that a separate SMR is required for each Compliance Sampling Point. (Quiz #9)



**As stated in your Permit Reporting Requirements:**

“Permittee is required to submit a compliance monitoring report [Self Monitoring Report (SMR)] no later than the 28th day of every calendar month.”

<b>SMR Due Date</b>	<b>City of Phoenix</b>
---------------------	------------------------

For example, the February SMR is due on March 28<sup>th</sup>. (Quiz #6)

We hate writing NOVs for late SMRs just as much as you hate responding to them!

**And please use your facility’s most recent SMR forms. Old forms contain out-date information like obsolete permit number and incorrect sampling frequencies. When you get a renewed permit, you will receive updated SMR forms. If you contract with a vendor for sampling, it is your responsibility to make sure they have the correct forms!**

- Flow and Certification Statement
- Sample Methodology Page
- Parameter Results Reporting Form
- Attachment A – No Solvent Dumping/TOMP*
- Attachment B – No Discharge Certification*
- Attachment C – No Cyanide Certification*
- pH Calibration & Analysis Log with Method QC Data
- Daily Flows with Calibration, Maintenance Log and/or Manual Flow Log
- ADHS Certified Laboratory Analysis report with QA/QC
- Sampling Chain of Custody (Must be Readable)

## SMR Checklist

City of Phoenix

Attachment A, B, and C are only to be submitted when REQUIRED.

PLEASE DO NOT sign and submit Attachments A-C if they do not apply. A permittee cannot certify both discharged flow and Zero discharge flow for the month unless the Zero discharge flow is for a week or a partial month due to a shut down in flow. (Quiz #10)

Attachment C – No Cyanide Certification only applies to facilities with cyanide points.

Also note that a separate SMR form is required for each compliance sampling location.

**Locked Form Instructions:**  
Use the TAB key to move to each data entry field.

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

Facility Name:	<u>Company Name</u>	
Address:	<u>0000 Address Street</u>	
	<u>Phoenix, Arizona 00000-0000</u>	
Permit Limits:	<u>Local Limits / 433.17 / 469.18 / etc.</u>	
Permit No.:	<u>XXXX-XXXX</u>	
Compliance Sampling Point:	<u>XXXXX.01</u>	
Report Period:	_____ Through _____	
<small>Flow is either Measured or Estimated - Not Both</small>		
Average Daily Flow through Compliance Sampling Point:	GPD Measured: <u>5000</u>	GPD Estimated: _____
Maximum Daily Flow through Compliance Sampling Point:	GPD Measured: <u>12000</u>	GPD Estimated: _____
Total Monthly Flow through Compliance Sampling Point:	Gallons Measured: <u>000,000</u>	Gallons Estimated: _____

**Include the following for EACH Compliance Sampling Point Report:**

<input type="checkbox"/> SMR Page 1 – Flow Page with Signed and Dated Certification	<input type="checkbox"/> Attachment B – Modified : Zero CYANIDE Discharge Certification <b>(Only if Applicable)</b>
<input type="checkbox"/> SMR Page 2 – Sampling Detail Page	<input type="checkbox"/> pH Calibration & Analysis Log with Method QC Data
<input type="checkbox"/> SMR Page 3 or 4 – Laboratory Results Reporting Table	<input type="checkbox"/> Daily Flows, Device Calibration, & Device Maintenance Log or Manual Flow Log
<input type="checkbox"/> Attachment A – TOMP/Solvent Certification <b>(Only if Applicable)</b>	<input type="checkbox"/> ADHS Certified Laboratory Analysis with QA/QC and Notes or Tags
<input type="checkbox"/> Attachment B - Zero Discharge Certification <b>(Only if Applicable)</b>	<input type="checkbox"/> Sampling Chain of Custody <b>(Must be Readable)</b>

*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Certifying Official Signature: Authorized Signatory

Certifying Official Name: Authorized Signatory

Certifying Official Title: QA Manager

Date: March 15, 2020

# Flow Data & Certification Statement

City of Phoenix

Permit conditions often require a **signed original** to be turned in! Digital signatures or scanned signatures are not acceptable!

Standard Conditions Section D. 1. d. *Permittee shall measure the daily maximum flows, monthly average daily flow, and total monthly flow discharged through the compliance sampling point(s) described in the Permit and include these results in Permittee's monthly compliance self-monitoring report.*

One of the primary uses of the flow data is for billing purposes, so you want it to be correct!

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

COMPLETE FOR EACH SAMPLING EVENT AND EACH SAMPLING POINT  
DURING THE REPORTING PERIOD

Facility Name: Company Name

Address: 0000 Address Street  
Phoenix, Arizona 00000-0000

Date/Time Samples Collected: 02/12/2020, quarterly sample, pH

Name(s) and Affiliation of Person(s) Sampling: Jill Sampler

Compliance Sampling Point No: XXXXX.01 Lab Project or Reference ID No: 123456

Device Type: 3-inch Parshall Flume

Location Description: In vault behind building

Electronic pH meter calibrated prior to analysis? Yes

Sampling Methodology (indicate sample type, collection method, and preservation for all pollutants sampled):

Type	Collection Method	Preservation
pH	Grab	N/A
Metals	Composite	HNO <sub>3</sub> /Ice
Cyanide	Grab	Ascorbic Acid/NaOH/Ice
VOCs	Grab	HCl/Ice
Semi-VOCs	Composite	Ice
Oil & Grease	Grab	H <sub>2</sub> SO <sub>4</sub> /Ice
BOD/TSS	Composite	Ice
COD	Composite	H <sub>2</sub> SO <sub>4</sub> /Ice

NOTE: If sample collection method was Hand Composite; a log showing date, time, flow rate, aliquot volumes, and final calculations for the final hand composite must be included with the report.

# Sample Event and Methodology

City of Phoenix

It is advisable to have a separate form for each sample; however multiple pH sampling days may be included on one sheet.

Non - Categorical with BOD/COD/TSS

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

Facility Name: Company Name

Report Period: February 1, 2020 to February 29, 2020

Lab Project or Reference ID #: 123456

Permit #: XXXX-XXXX

Compliance Point #: XXXX.01

Compliance Point Description: 3-inch Parshall Flume

Parameter	Unit	Daily Limit	Sampling Frequency	Sample Type	Date:	Analysis Method								
Arsenic	mg/L	0.13	1 per Quarter	FPC										
BOD	mg/L	N/A	1 per Quarter	FPC										
Cadmium	mg/L	0.047	1 per Quarter	FPC										
COD	mg/L	N/A	1 per Quarter	FPC										
Copper	mg/L	1.5	1 per Quarter	FPC										
Cyanide (T)	mg/L	2.0	1 per Quarter	Grab										
Lead	mg/L	0.41	1 per Quarter	FPC										
Mercury	mg/L	0.0023	1 per 6-Mos	FPC										
Molybdenum	mg/L	N/A	1 per 6-Mos	FPC										
pH	S.U.	5.0-10.5	1 per Week	Grab										
Selenium	mg/L	0.10	1 per 6-Mos	FPC										
Silver	mg/L	1.2	1 per Quarter	FPC										
TSS	mg/L	N/A	1 per Quarter	FPC										
Zinc	mg/L	3.5	1 per Quarter	FPC										

Parameter Report Form

City of Phoenix

The parameter report form reflects the parameters, averages, and sampling frequency identified in your permit.

This is an example of a Parameter table for a Non-Categorical SIU. There are no monthly limits for non-categorical industries.

**Categorical (433.17) with BOD/TSS**

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

Facility Name: Company Name

Permit No: XXXX-XXXXX

Report Period: February 1, 2020 to February 29, 2020

Compliance Point No: XXXXX.01

Lab Project or Reference ID No: 123456

Compliance Point Description: 3-inch Parshall Flume

Parameter	Unit	Daily Limit	Sampling Frequency	Sample Type	Date:	Analysis Method	Monthly Limit	Monthly Average						
Arsenic	mg/L	0.13	1 per Quarter	FPC										
BOD	mg/L	N/A	1 per Quarter	FPC										
Cadmium	mg/L	0.047	1 per Quarter	FPC									0.07	
Chromium	mg/L	2.77	1 per Quarter	FPC									1.71	
Copper	mg/L	1.5	1 per Quarter	FPC									2.07	
Cyanide(T)	mg/L	1.20	1 per Quarter	Grab									0.65	
Lead	mg/L	0.41	1 per Quarter	FPC									0.43	
Mercury	mg/L	0.0023	1 per 6-Mos.	FPC										
Molybdenum	mg/L	N/A	1 per Quarter	FPC										
Nickel	mg/L	3.98	1 per Quarter	FPC									2.38	
pH	S.U.	5.0-10.5	1 per Week	Grab										
Selenium	mg/L	0.10	1 per Quarter	FPC										
Silver	mg/L	0.43	1 per Quarter	FPC									0.24	
TSS	mg/L	N/A	1 per Quarter	FPC										
TTO	mg/L	2.13	1 per 6-Mos.	G/FPC										
Zinc	mg/L	2.61	1 per Quarter	FPC									1.48	

NOTES:

Parameter Report Form

City of Phoenix

Most categorical businesses have monthly average limits as well as daily limits. Pay attention to your permit limits as it is possible (especially for 433.17) that the Daily Average Limit may be lower than the Monthly Limit.

Total Toxic Organics (TTOs) limits were established for the following categorical industries: Electroplating (40 CFR Part 413), Metal Finishing (40 CFR Part 433), Electrical and Electric Components (40 CFR Part 469), Copper Forming (40 CFR Part 468), Aluminum Forming (40 CFR Part 467), and Coil Coating (40 CFR Part 465). The type of pollutants that comprise the parameter TTOs vary according to the category. TTO is defined as the sum of the masses or concentrations of specific toxic organic compounds found in the Categorical Industrial User (CIU) discharges at >0.01 mg/l.

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

Facility Name: Company Name Permit No: XXXXX.XXXX  
 Report Period: February 1, 2020 to February 29, 2020 Compliance Point No: XXXXX.01  
 Lab Project or Reference ID No: 123456 Compliance Point Description: 3-inch Parshall Flume

Parameter	Unit	Daily Limit	Sampling Frequency	Sample Type	Date:	Analysis Method	Monthly Limit	Monthly Average						
Cyanide (A)	mg/L	1.20	1 per Batch	Grab									0.65	

NOTES:

This form is to be submitted for each sampling point.

**Sampling Frequency** - The required minimum sampling frequency from your Permit.

**Sample Type** - FPC is a Flow Proportional Composite; GFPC is a combination of Grab and Flow Proportional samples as specified in 40 CFR 136.

**Date** - Enter the date the sample was taken and enter the result for each parameter under the date. Do not enter the "ND" from the laboratory as a sample result. Enter less than (<) the detection limit for the parameter. For example <0.05.

**Analysis Method** - The analysis method used by the laboratory is to be entered for each result. All samples must be analyzed by the analytical methods required by the Permit. Copies of the laboratory analytical reports must be submitted with this form.

**Monthly Average** - This column must be completed for all applicable parameters

Parameter Report Form

City of Phoenix

Companies with cyanide points must document the cyanide analysis on a separate results page.

Facility Name: ABC Metals

Permit No: 1703-0000

Report Period: February 1, 2018 to February 28, 2018

Compliance Point No: 0000.01

Lab Project or Reference ID No: 012345

Compliance Point Description: 45° Weir box

Parameter	Unit	Daily Limit	Sampling Frequency	Sample Type	Date: 02/05	Analysis Method	Date: 02/12	Analysis Method	Date: 02/19	Analysis Method	Date: 02/26	Analysis Method	Monthly Limit	Monthly Average
Arsenic	mg/L	0.13	1 per Quarter	FPC			<0.010	200.7						
Cadmium	mg/L	0.047	1 per Quarter	FPC			<0.0010	200.7					0.07	<0.0010
Chromium	mg/L	2.77	1 per Quarter	FPC			0.0172	200.7					1.71	0.0172
Copper	mg/L	1.50	1 per Quarter	FPC			<0.020	200.7					2.07	<0.020
Cyanide (T)	mg/L	1.20	1 per Quarter	Grab			<0.010	SM4500 CNE					0.65	<0.010
Lead	mg/L	0.41	1 per Quarter	FPC			<0.0150	200.7					0.43	<0.0150
Mercury	mg/L	0.0023	1 per 6-mos	FPC			<0.00020	245.1						
Molybdenum	mg/L	N/A	1 per Quarter	FPC			<0.010	200.7						
Nickel	mg/L	3.98	1 per Quarter	FPC			0.304	200.7					2.38	0.304
pH	S.U.	5.0-10.5	1 per Week	Grab	7.52	SM4500	8.02	SM4500 H+B	7.43	SM4500	7.75	SM4500		
Selenium	mg/L	0.10	1 per Quarter	FPC			<0.10	200.7						
Silver	mg/L	0.43	1 per Quarter	FPC			<0.010	200.7					0.24	<0.010
TTO	mg/L	2.13	1 per 6-mos	G/FPC			cert							
Zinc	mg/L	2.61	1 per Quarter	FPC			<0.050	200.7					1.48	<0.050

**Parameter Report Form**

**City of Phoenix**

Make sure you are using the most up to date form with the correct permit number on it!

For industries required to collect continuous pH reading there is an additional log. Batch dischargers may also submit a separate log for pH results or modify the flow page to suit their needs.

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

**pH Calibration & Analysis Log**

Meter No: \_\_\_\_\_ Compliance Sampling Point No: **XXXXX.01**

Calibration Standard	Date	Analyst Initials	Analysis Time	Reading (Units)	Temp Reading (°C)	Calibration Slope (mV or %)	Comments
pH Buffer 4/Lot#							
pH Buffer 7/Lot#							
pH Buffer 10/Lot#							
2 <sup>nd</sup> Buffer pH 7 (6.9 - 7.1)/Lot#						Pass or Fail	
Compliance pH Result						N/A	
pH Buffer 4/Lot#							
pH Buffer 7/Lot#							
pH Buffer 10/Lot#							
2 <sup>nd</sup> Buffer pH 7 (6.9 - 7.1)/Lot#						Pass or Fail	
Compliance pH Result						N/A	
pH Buffer 4/Lot#							
pH Buffer 7/Lot#							
pH Buffer 10/Lot#							
2 <sup>nd</sup> Buffer pH 7 (6.9 - 7.1)/Lot#						Pass or Fail	
Compliance pH Result						N/A	
pH Buffer 4/Lot#							
pH Buffer 7/Lot#							
pH Buffer 10/Lot#							
2 <sup>nd</sup> Buffer pH 7 (6.9 - 7.1)/Lot#						Pass or Fail	
Compliance pH Result						N/A	
Once/Month Duplicate Sample (w-0.1 Acceptance)			Orig Reading:		Dup Reading:		
Once/Month Verification Check/Buffer 7						Pass or Fail	

NOTE: Grab pH Analysis for purposes of compliance sampling must be performed within 15 minutes sample collection using one of the methods specified for Hydrogen Ion in Title 40 of the Code of Federal Regulations Part 136; typically SM4500 H+ B. Arizona Department of Environmental Quality has provided guidance for complying with the Calibration and QA/QC portions of the approved analytical methods. This pH calibration log may aid in meeting the minimum criteria. Please see the manufacturer's manual for your pH meter to determine the acceptable slope in mV or %.

NOTE: Permittees are required to calibrate field and/or bench pH meters each day of use for Grab pH Analysis.

NOTE: Permittees are required to keep original copy of pH Calibration and Analysis Logs onsite and available for review for a minimum of three years; a copy of the hand-written original must be submitted with the monthly SMR.

pH Meter Calibration Check
City of Phoenix

Please note that Method SM4500 states to calibrate the meter before each sample when sampling intermittently (weekly).

Industries with continuous pH requirements need to calibrate their meters at minimum once a month.

## Continuous pH Guidance

1. Designate primary and backup pH probe
2. Probe placement
3. Determine flow rate (gpm) the flow meter cannot accurately measure flow.
4. Define flow rate at which probe is no longer submerged
5. Discontinue recording continuous pH measurements when 3 and 4 apply
6. Report **ALL** excursions, known or suspected within **24 hours**

Continuous pH Monitoring

City of Phoenix

The City of Phoenix Continuous pH Guidance is available on request!

**Locked Form Instructions:**  
Use the TAB key to move  
to each data entry field.

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

**ATTACHMENT A**

**EPA Method 150.2  
Continuous pH Reporting:**

Facility Name:

Address:

Permit No:

Compliance Sampling Point:

	Date	pH Minimum	Time	pH Maximum	Time
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

Continuous  
pH log

City of Phoenix

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

Compliance Sampling Point No: **XXXXXX.01**

**Daily Flows, Device Calibration, & Device Maintenance Log**

Date	Totalizer Reading	Daily Flow to Sewer (gpd)	Meter Level (inches)	Measured Level (inches)	<input type="checkbox"/> Meter Adjusted	<input type="checkbox"/> Sampling Device Cleaned
Last					<input type="checkbox"/>	<input type="checkbox"/>
1.					<input type="checkbox"/>	<input type="checkbox"/>
2.					<input type="checkbox"/>	<input type="checkbox"/>
3.					<input type="checkbox"/>	<input type="checkbox"/>
4.					<input type="checkbox"/>	<input type="checkbox"/>
5.					<input type="checkbox"/>	<input type="checkbox"/>
6.					<input type="checkbox"/>	<input type="checkbox"/>
7.					<input type="checkbox"/>	<input type="checkbox"/>
8.					<input type="checkbox"/>	<input type="checkbox"/>
9.					<input type="checkbox"/>	<input type="checkbox"/>
10.					<input type="checkbox"/>	<input type="checkbox"/>
11.					<input type="checkbox"/>	<input type="checkbox"/>
12.					<input type="checkbox"/>	<input type="checkbox"/>
13.					<input type="checkbox"/>	<input type="checkbox"/>
14.					<input type="checkbox"/>	<input type="checkbox"/>
15.					<input type="checkbox"/>	<input type="checkbox"/>
16.					<input type="checkbox"/>	<input type="checkbox"/>
17.					<input type="checkbox"/>	<input type="checkbox"/>
18.					<input type="checkbox"/>	<input type="checkbox"/>
19.					<input type="checkbox"/>	<input type="checkbox"/>
20.					<input type="checkbox"/>	<input type="checkbox"/>
21.					<input type="checkbox"/>	<input type="checkbox"/>
22.					<input type="checkbox"/>	<input type="checkbox"/>
23.					<input type="checkbox"/>	<input type="checkbox"/>
24.					<input type="checkbox"/>	<input type="checkbox"/>
25.					<input type="checkbox"/>	<input type="checkbox"/>
26.					<input type="checkbox"/>	<input type="checkbox"/>
27.					<input type="checkbox"/>	<input type="checkbox"/>
28.					<input type="checkbox"/>	<input type="checkbox"/>
29.					<input type="checkbox"/>	<input type="checkbox"/>
30.					<input type="checkbox"/>	<input type="checkbox"/>
31.					<input type="checkbox"/>	<input type="checkbox"/>
Average Flow						
Maximum Flow						
Total Gallons						

Flow Reporting and Meter Level Check

City of Phoenix

City of Phoenix requires SIU's with an open channel flow device (flume, weir) to do a "ruler level check" in inches and compare that to the flow meter level in inches. Calculate the flow rate from the height based on the primary flow measurement device and compare the ruler measured flow to the meter read flow. Recalibrate the flow meter if necessary.

Conduct a calibration check at a minimum of once per month.

The procedure ensures the flow meter is accurately measuring wastewater discharge flow.

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM

ATTACHMENT A

**No Solvent Dumping and TOMP Implementation Certification**

*Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for total toxic organics (TTO), I certify that, to be best of my knowledge and belief, no dumping of concentrated toxic organics into the wastewater has occurred since filing the last discharge [self-]monitoring report. I further certify that this facility is implementing the toxic organic management plan (TOMP) submitted to the City of Phoenix.*

Report Period: February 1, 2020 Through February 29, 2020

Facility Name: Company Name  
Address: 0000 Address Street  
Phoenix, Arizona 00000-0000

Permit №: XXXX-XXXXX  
Compliance Sampling Point: XXXXX.01

Certifying Official Signature Authorized Signatory  
Certifying Official Printed Name Authorized Signatory  
Certifying Official Title QA Manager  
Date March 15, 2020

Attachment A – TOMP  
No Solvent Dumping

City of Phoenix

This attachment is required for certain categorical users to certify that their Toxic Organic Management Plan (TOMP) is being adhered to.

This certification is in place of sampling for Total Toxic Organics (TTOs) as specified in the facility's permit and must be submitted monthly with the SMR.

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM  
ATTACHMENT B

Zero Discharge Certification

*Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitations, I certify that to the best of my knowledge and belief, no discharge to sewer of process wastewaters regulated by the Federal Point Source Categories specified at 40 CFR 405-471 occurred during the monitoring period covered by this report. I am aware of the potential for significant penalties for submission of false information, including the possibility of fines and imprisonment for knowing violations. I will retain copies of all manifests and/or waste hauler receipts on-site for no less than 3 years and make them available to City of Phoenix personnel upon request.*

Report Period: February 1, 2020 Through February 29, 2020

Facility Name: Company Name  
Address: 0000 Address Street  
Phoenix, Arizona 00000-0000

Permit №: XXXX-XXXXX  
Compliance Sampling Point\*: XXXXX.01

Certifying Official Signature Authorized Signatory  
Certifying Official Printed Name Authorized Signatory  
Certifying Official Title QA Manager  
Date March 15, 2020

Attachment B –  
No Discharge Certification

City of Phoenix

You will only submit this attachment when there has been no process discharge for a period of time that would prevent you from collecting samples as prescribed in your facility's permit.

For example, most facilities are required to take weekly pH samples. If the facility's process flow is shut down for maintenance for two weeks then you would need to submit a zero discharge certificate for those two weeks.

CITY OF PHOENIX  
SIGNIFICANT INDUSTRIAL USER  
SELF-MONITORING REPORT FORM  
ATTACHMENT B – MODIFIED

Zero Cyanide Discharge Certification

Based on my inquiry of the person or persons directly responsible for managing compliance with the permit limitations, I certify that to the best of my knowledge and belief, no discharge to sewer of CYANIDE process wastewaters regulated by the Federal Point Source Categories specified at 40 CFR 405-471 occurred during the monitoring period covered by this report. I am aware of the potential for significant penalties for submission of false information, including the possibility of fines and imprisonment for knowing violations. I will retain copies of all manifests and/or waste hauler receipts on-site for no less than 3 years and make them available to City of Phoenix personnel upon request.

Report Period: February 1, 2020 Through February 29, 2020

Facility Name: Company Name  
Address: 0000 Address Street  
Phoenix, Arizona 00000-0000

Permit No: XXXX-XXXXX  
Cyanide Sampling Point\*: XXXXX.01

Certifying Official Signature Authorized Signatory

Certifying Official Printed Name Authorized Signatory

Certifying Official Title QA Manager

Date March 15, 2020

Attachment C –  
No Cyanide Certification

City of Phoenix

This certificate is only required from facilities that have cyanide points

**Client Sample Results**

Client: RDH Environmental Services LLC TestAmerica Job ID: \_\_\_\_\_  
 Project/Site: \_\_\_\_\_

**Client Sample ID:** \_\_\_\_\_ **Lab Sample ID:** \_\_\_\_\_  
**Date Collected:** 01/27/16 08:32 **Matrix:** Water  
**Date Received:** 01/27/16 14:12

---

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.10	mg/L		01/28/16 10:18	01/29/16 11:19	1
Cadmium	ND		0.0010	mg/L		01/28/16 10:18	01/29/16 11:19	1
Chromium	0.018		0.010	mg/L		01/28/16 10:18	01/29/16 11:19	1
Copper	0.020		0.010	mg/L		01/28/16 10:18	01/29/16 11:19	1
Lead	ND		0.015	mg/L		01/28/16 10:18	01/29/16 11:19	1
Nickel	0.020		0.010	mg/L		01/28/16 10:18	01/29/16 11:19	1
Selenium	ND		0.10	mg/L		01/28/16 10:18	01/29/16 11:19	1
Silver	ND		0.010	mg/L		01/28/16 10:18	01/29/16 11:19	1
Molybdenum	0.011		0.010	mg/L		01/28/16 10:18	01/29/16 11:19	1
Zinc	ND		0.050	mg/L		01/28/16 10:18	01/29/16 11:19	1

---

**Method: 245.1 - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	mg/L		01/28/16 19:23	02/03/16 13:26	1

---

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	ND		0.0080	mg/L		02/02/16 11:30	02/02/16 13:46	1

Lab Analysis example
City of Phoenix

Please review your lab report immediately! You only have 24 hours to report an exceedance!

Do not report your data in the parameter results table as ND (non-detect). Your data values should be reported as less than (<) the reporting limit.

**QC Sample Results**

Client: RDH Environmental Services LLC  
Project/Site:

TestAmerica Job ID: !

**Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)**

Lab Sample ID: 550-57886-F-1-A MS  
Matrix: Water  
Analysis Batch: 82891

Client Sample ID: Matrix Spike  
Prep Type: Total/NA  
Prep Batch: 82782

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	ND		1.00	0.986		mg/L		99	70 - 130
Chromium	ND		1.00	0.976		mg/L		97	70 - 130
Copper	ND		1.00	1.03		mg/L		102	70 - 130
Lead	ND		1.00	1.02		mg/L		102	70 - 130
Nickel	ND		1.00	0.957		mg/L		95	70 - 130
Selenium	ND		1.00	1.06		mg/L		106	70 - 130
Silver	ND		0.0750	0.0761		mg/L		101	70 - 130
Molybdenum	0.014		1.00	0.994		mg/L		98	70 - 130
Zinc	ND		1.00	1.03		mg/L		100	70 - 130

Lab Sample ID: 550-57886-F-1-B MSD  
Matrix: Water  
Analysis Batch: 82891

Client Sample ID: Matrix Spike Duplicate  
Prep Type: Total/NA  
Prep Batch: 82782

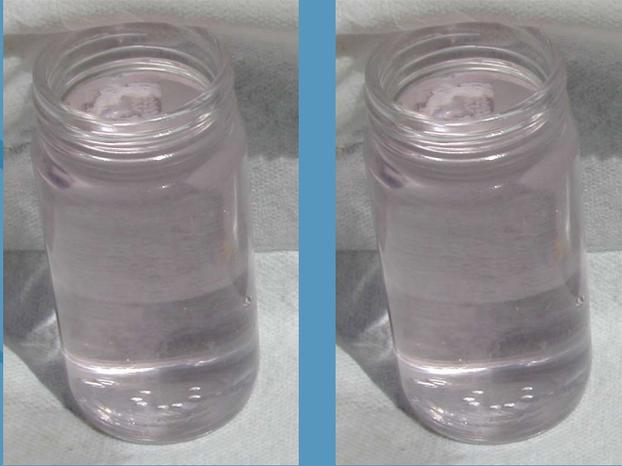
Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Arsenic	ND		1.00	1.03		mg/L		103	70 - 130	0	20
Cadmium	ND		1.00	0.996		mg/L		100	70 - 130	1	20
Chromium	ND		1.00	0.986		mg/L		98	70 - 130	1	20
Copper	ND		1.00	1.04		mg/L		103	70 - 130	1	20
Lead	ND		1.00	1.03		mg/L		103	70 - 130	0	20
Nickel	ND		1.00	0.969		mg/L		96	70 - 130	1	20
Selenium	ND		1.00	1.07		mg/L		107	70 - 130	1	20
Silver	ND		0.0750	0.0769		mg/L		103	70 - 130	1	20
Molybdenum	0.014		1.00	0.998		mg/L		98	70 - 130	0	20
Zinc	ND		1.00	1.04		mg/L		101	70 - 130	1	20

8

Lab QC Data example

City of Phoenix

# Split Sample Policy



City of Phoenix

The City of Phoenix's split sample policy was revised in June 2024 after a routine EPA audit required a change in how we handle split samples.

If a facility requests a split sample, the city wastewater samplers must first determine that there is enough sample volume collected to fill all of the city's required sample bottles plus the facility's split sample. The samples will be split using a rotational pour-off method to maintain a well mixed, representative sample.

CITY OF PHOENIX WATER SERVICES DEPARTMENT		ENVIRONMENTAL SERVICES DIVISION CHAIN OF CUSTODY RECORD			DATE RECEIVED	FOR LABORATORY USE ONLY	
AGENCY NAME <i>11200 Ford Center's Plaza Court</i>				REMARKS		PRESERVATIVE USED	# OF CONTAINERS
INSPECTOR NAME (PRINT) <i>Scott McQuinn</i>							
SAMPLE NUMBER	COLLECTION			SAMPLE DESCRIPTION / TEST REQUESTED			
	Date	Time	Location				
<i>400357056</i>	<i>3/6/18</i>	<i>0935</i>	<i>1S10.06</i>	<i>As, Cl, Cr, Cd, Pb, Hg, Mn, Ni, Se, N, Zn</i>		<i>None</i>	<i>50ml</i>
<i>400357059</i>	<i>3/6/18</i>	<i>0957</i>	<i>1S10.09</i>	<i>Cyanide</i>		<i>None</i>	<i>50ml</i>
BOTTLE PROVIDED BY: COP <input checked="" type="checkbox"/> I.U. <input type="checkbox"/>				ALL SAMPLES PRESERVED: <input checked="" type="checkbox"/>			
				ALL SAMPLES PROPERLY LABELED: <input checked="" type="checkbox"/>			
				ALL SAMPLES PROPERLY CUSTODY SEALED: <input checked="" type="checkbox"/>			
TOTAL NUMBER OF CONTAINERS						<i>2</i>	
SAMPLED / RELINQUISHED BY <i>[Signature]</i>		DATE <i>3/6/18</i>	TIME <i>1017</i>	RECEIVED BY <i>[Signature]</i>		CONDITION <i>GOOD</i>	
WHITE / YELLOW COPIES TO: LABORATORY / INDUSTRIAL USER				PINK COPY TO: CITY OF PHOENIX INSPECTOR			

Split Sample CoC

City of Phoenix

Once the samples have been split, the city will provide the facility with a chain of custody form with the sample. Please remember that the facility needs to provide their own bottles for split samples. Sample bottles can be provided by the analytical lab being used.

Please review this for errors! We are all human and errors occur.

## Example Split Sample Results

IU results

400794136-S	02/14/2025	Arsenic	<0.002	mg/L	200.8
400794136-S	02/14/2025	Cadmium	0.008	mg/L	200.8
400794136-S	02/14/2025	Chromium	0.009	mg/L	200.8
400794136-S	02/14/2025	Selenium	<0.002	mg/L	200.8
400794136-S	02/14/2025	Zinc	0.164	mg/L	200.8

City results

Sample End Date	Substance	prefix	Result	Unit	Detection Limit	Report Limit
2/14/2025	Arsenic (TR)		< 0.0037	mg/L	0.0037	0.005
2/14/2025	Cadmium (TR)		0.009	mg/L	0.00037	0.002
2/14/2025	Chromium (TR)		0.0093	mg/L	0.0014	0.005
2/14/2025	Selenium (TR)		< 0.00435	mg/L	0.00435	0.005
2/14/2025	Zinc (TR)		0.179	mg/L	0.01	0.06

City of Phoenix

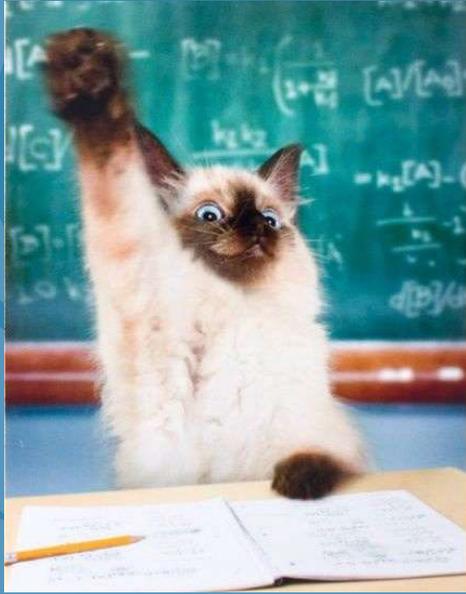
The major change is that the compliance result will be the calculated average of the City sample result and the IU lab result for all parameters identified for the split. The calculated average will be considered the compliance sample value.

## Final Calculated Compliance Result

Sample End Date	Substance	Calculated result	Unit
2/14/2025	Arsenic (TR)	.00285	mg/L
2/14/2025	Cadmium (TR)	0.009	mg/L
2/14/2025	Chromium (TR)	0.009	mg/L
2/14/2025	Selenium (TR)	.003175	mg/L
2/14/2025	Zinc (TR)	0.172	mg/L

**City of Phoenix**

For values <RL, we take ½ the RL and average together



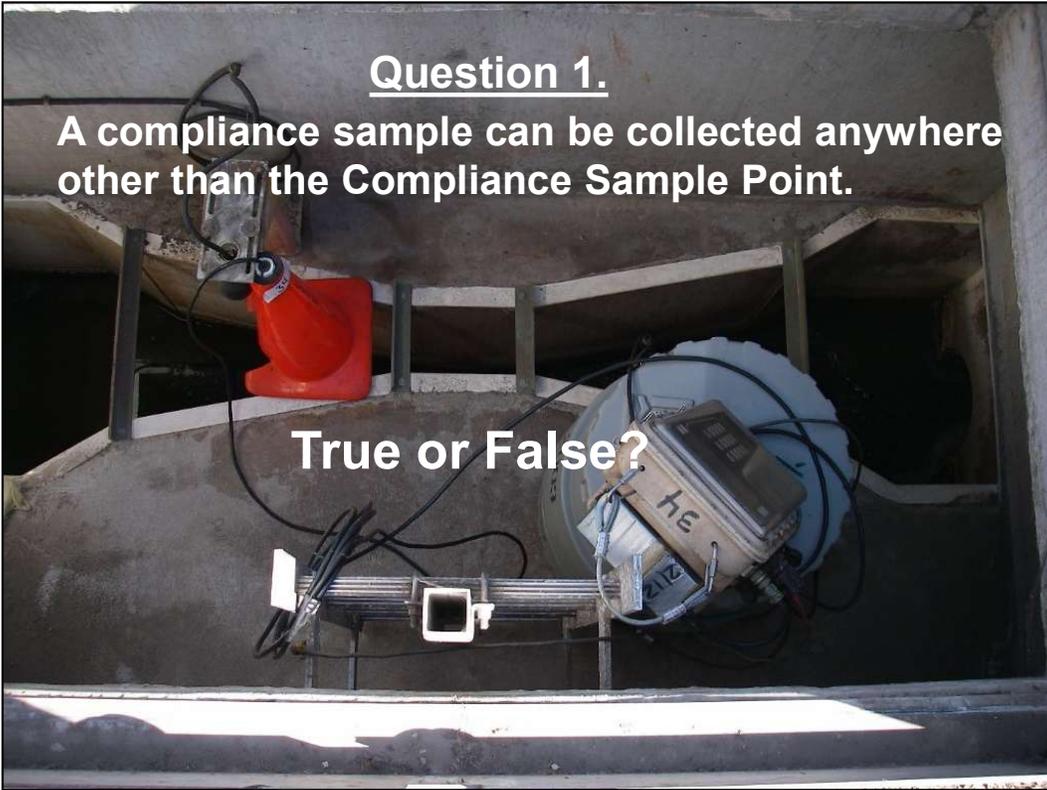
# QUIZ

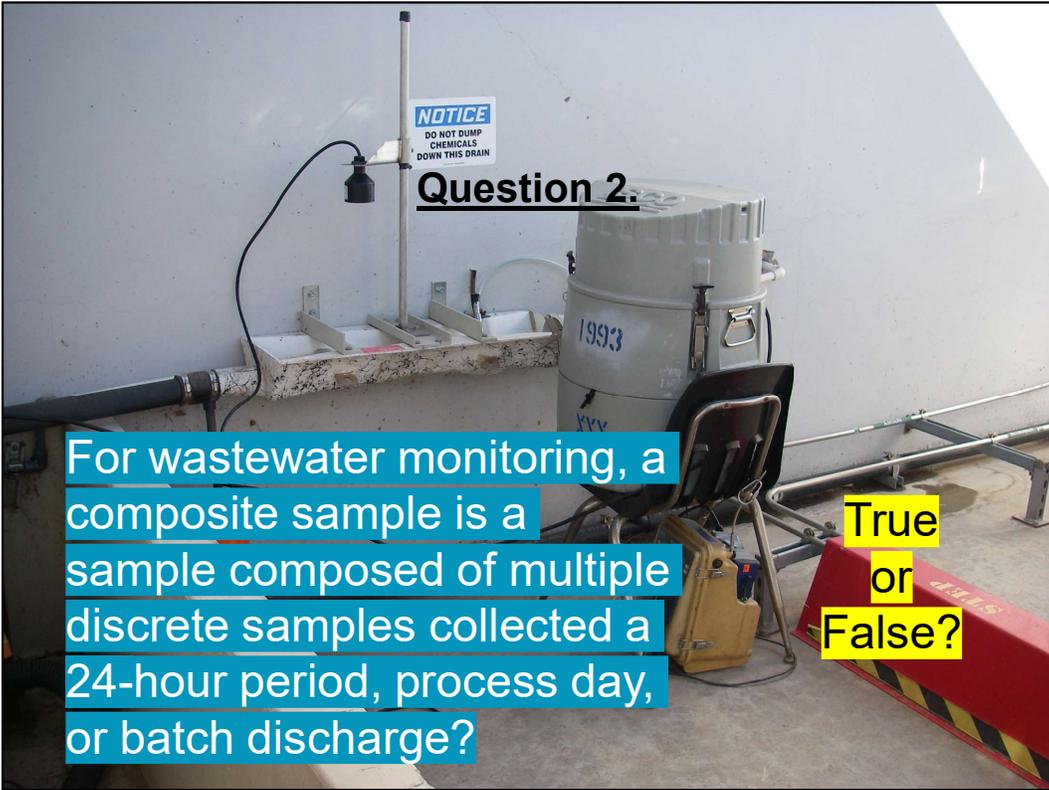
City of Phoenix

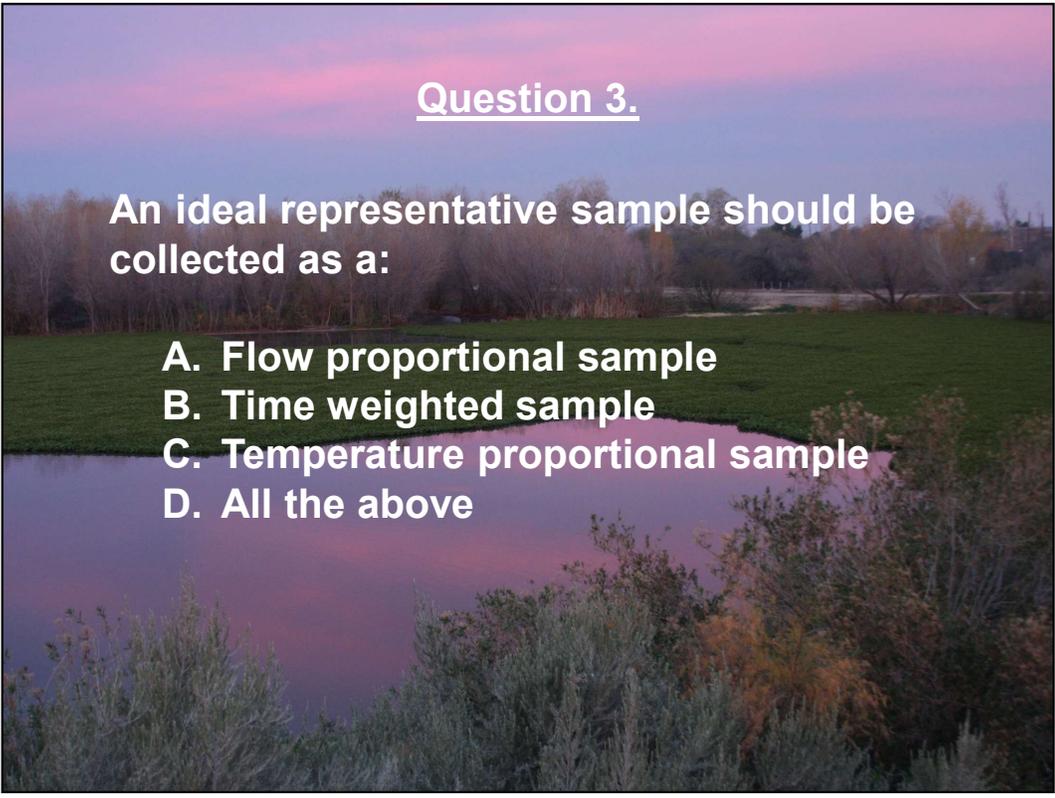
Question 1.

A compliance sample can be collected anywhere other than the Compliance Sample Point.

True or False?



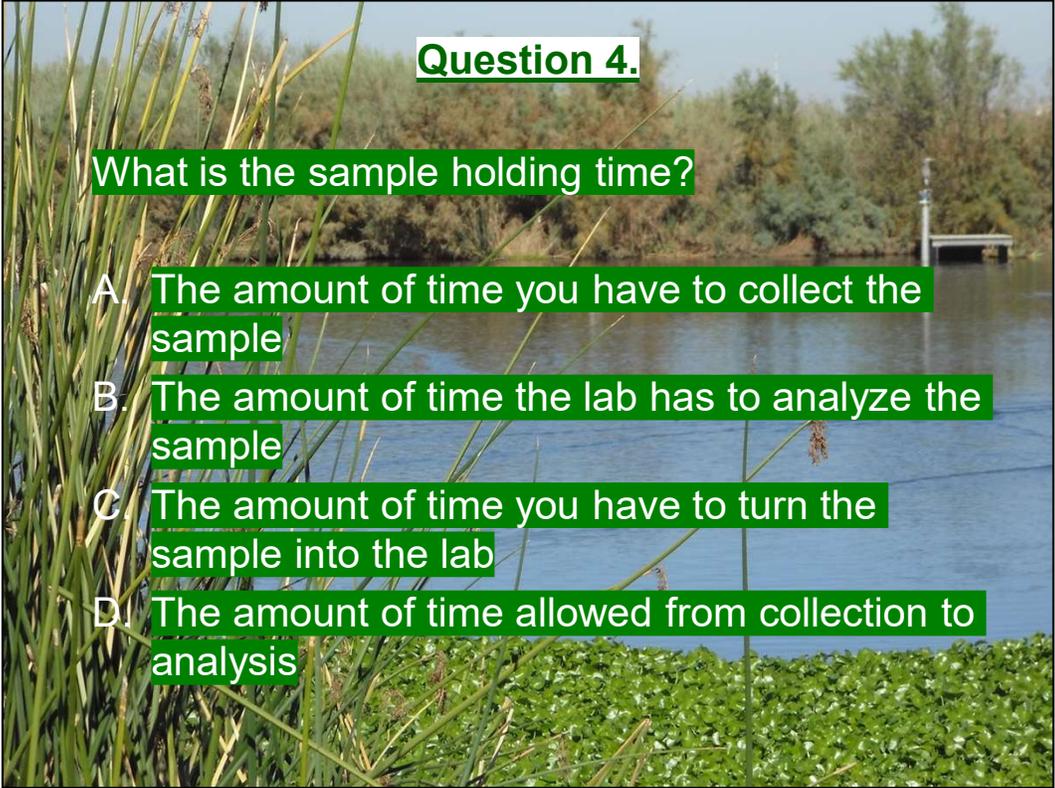




Question 3.

An ideal representative sample should be collected as a:

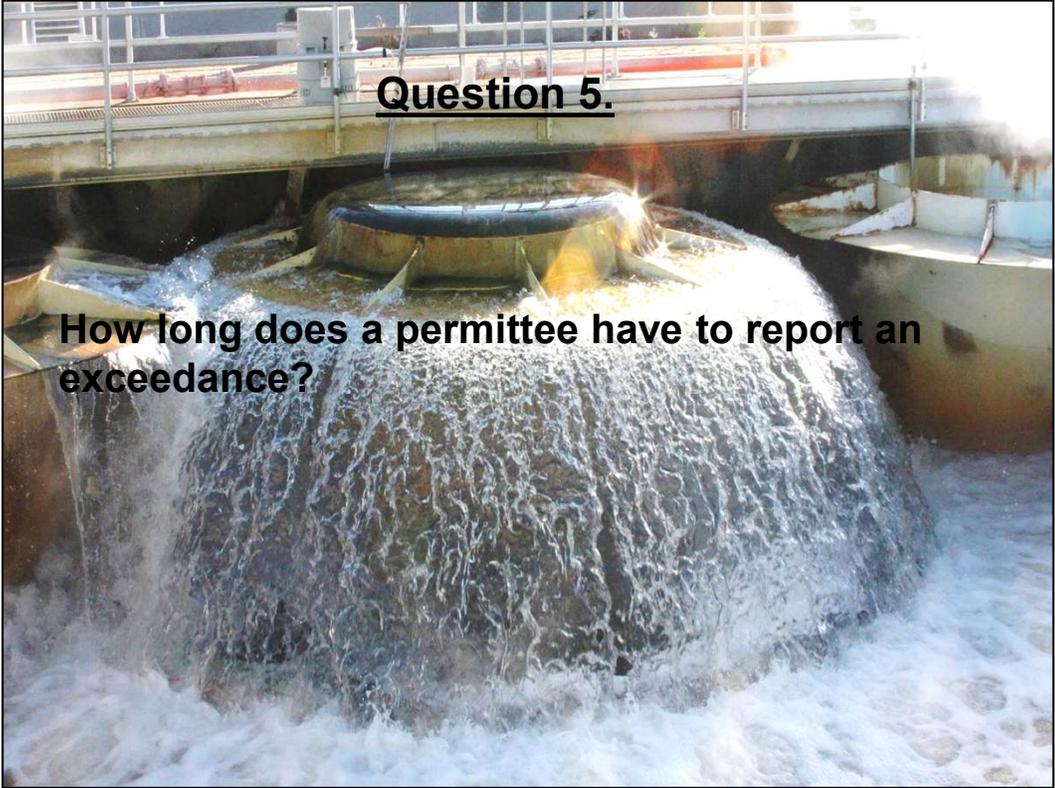
- A. Flow proportional sample
- B. Time weighted sample
- C. Temperature proportional sample
- D. All the above

The background of the slide is a photograph of a river or lake. In the foreground, there are tall, green reeds on the left and a dense patch of green aquatic plants on the right. The water is calm and blue. In the distance, there are trees and a small white structure, possibly a boat or a pier, on the right side.

**Question 4.**

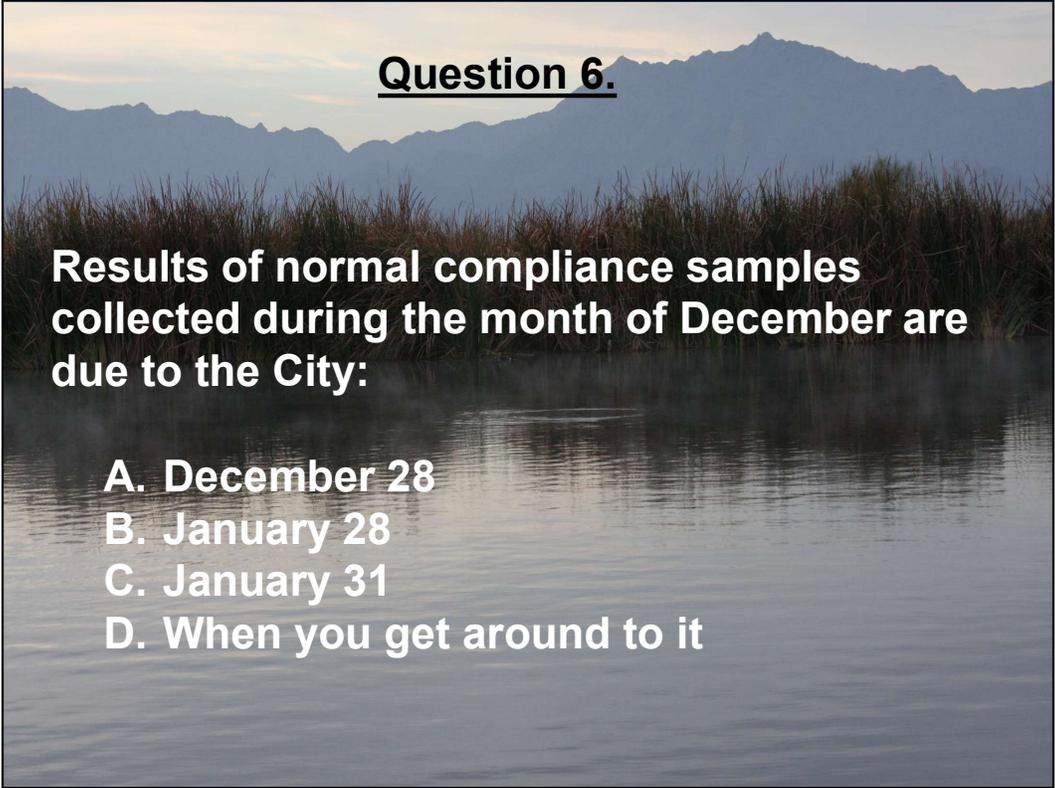
What is the sample holding time?

- A. The amount of time you have to collect the sample
- B. The amount of time the lab has to analyze the sample
- C. The amount of time you have to turn the sample into the lab
- D. The amount of time allowed from collection to analysis



**Question 5.**

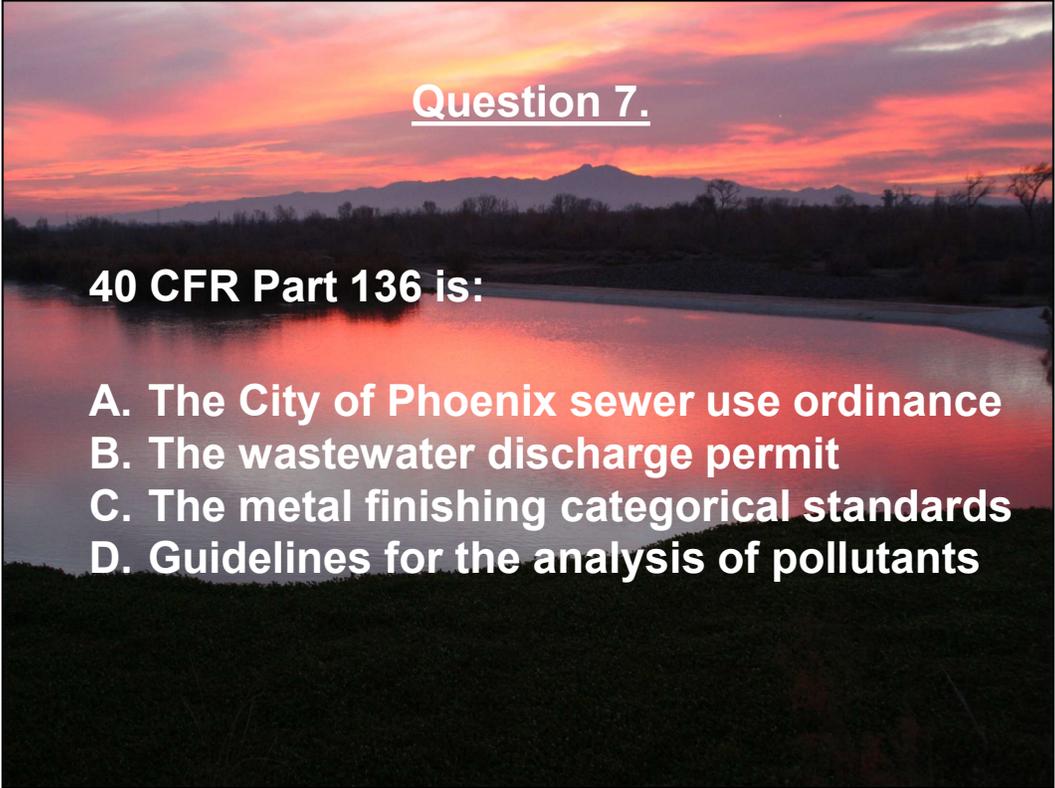
**How long does a permittee have to report an exceedance?**

The background of the slide is a photograph of a natural landscape. In the foreground, there is a body of water reflecting the sky. A line of tall, brown reeds or grasses grows along the water's edge. In the background, a range of mountains is visible under a soft, hazy sky, suggesting a dawn or dusk setting.

**Question 6.**

**Results of normal compliance samples collected during the month of December are due to the City:**

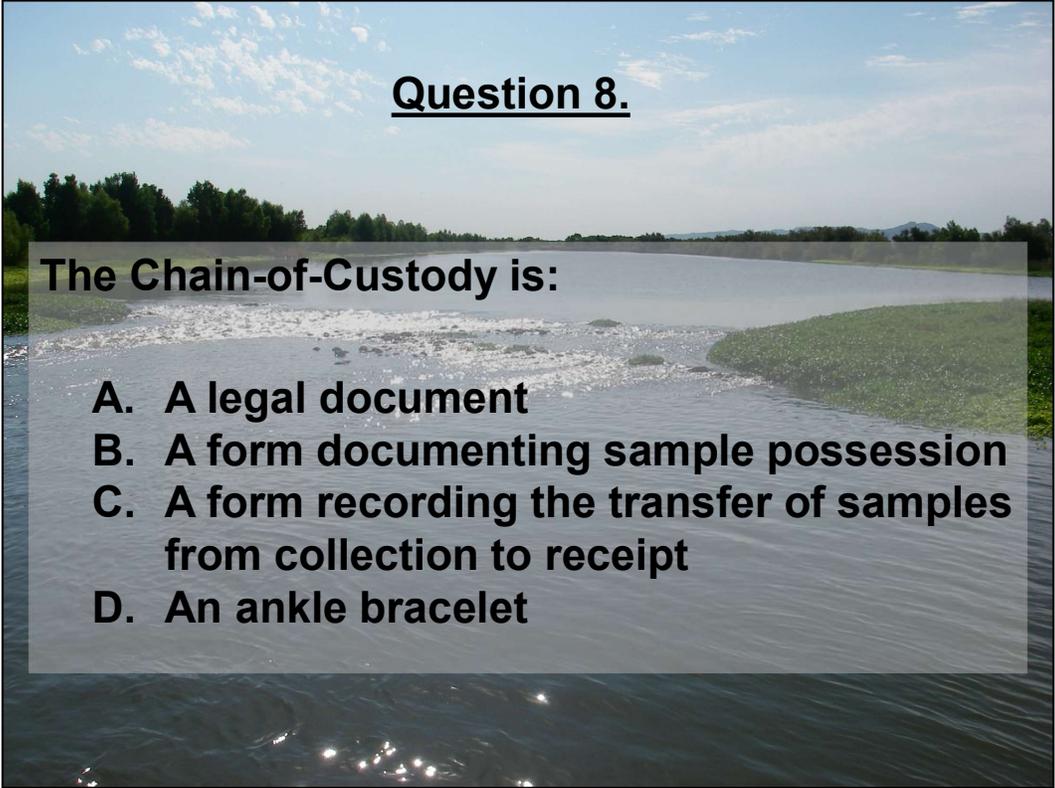
- A. December 28**
- B. January 28**
- C. January 31**
- D. When you get around to it**



Question 7.

**40 CFR Part 136 is:**

- A. The City of Phoenix sewer use ordinance**
- B. The wastewater discharge permit**
- C. The metal finishing categorical standards**
- D. Guidelines for the analysis of pollutants**



**Question 8.**

**The Chain-of-Custody is:**

- A. A legal document**
- B. A form documenting sample possession**
- C. A form recording the transfer of samples from collection to receipt**
- D. An ankle bracelet**



**Question 9.**

**A separate SMR form needs to be completed for each sampling site.**

**True or False?**

Question 10.

**Is a Zero Discharge Certification required to be submitted each month?**

Thank you for participating in the City of Phoenix's Industrial Pretreatment Program's 2026 Compliance Academy.

Please take a few minutes to respond to our survey

**City of Phoenix**

Notes:



Notes:

# Periodic Table of Elements

# Los Alamos National Laboratory Chemistry Division

## Periodic Table of the Elements

1A 1 <b>H</b> 1s <sup>1</sup> hydrogen 1.008																	8A 2 <b>He</b> 1s <sup>2</sup> helium 4.003						
3 <b>Li</b> [He]2s <sup>1</sup> lithium 6.941	2A 4 <b>Be</b> [He]2s <sup>2</sup> beryllium 9.012																	3A 5 <b>B</b> [He]2s <sup>2</sup> 2p <sup>1</sup> boron 10.81	4A 6 <b>C</b> [He]2s <sup>2</sup> 2p <sup>2</sup> carbon 12.01	5A 7 <b>N</b> [He]2s <sup>2</sup> 2p <sup>3</sup> nitrogen 14.01	6A 8 <b>O</b> [He]2s <sup>2</sup> 2p <sup>4</sup> oxygen 16.00	7A 9 <b>F</b> [He]2s <sup>2</sup> 2p <sup>5</sup> fluorine 19.00	10 <b>Ne</b> [He]2s <sup>2</sup> 2p <sup>6</sup> neon 20.18
11 <b>Na</b> [Ne]3s <sup>1</sup> sodium 22.99	12 <b>Mg</b> [Ne]3s <sup>2</sup> magnesium 24.31	3B	4B	5B	6B	7B	8B		11B	12B	13 <b>Al</b> [Ne]3s <sup>2</sup> 3p <sup>1</sup> aluminum 26.98	14 <b>Si</b> [Ne]3s <sup>2</sup> 3p <sup>2</sup> silicon 28.09	15 <b>P</b> [Ne]3s <sup>2</sup> 3p <sup>3</sup> phosphorus 30.97	16 <b>S</b> [Ne]3s <sup>2</sup> 3p <sup>4</sup> sulfur 32.07	17 <b>Cl</b> [Ne]3s <sup>2</sup> 3p <sup>5</sup> chlorine 35.45	18 <b>Ar</b> [Ne]3s <sup>2</sup> 3p <sup>6</sup> argon 39.95							
19 <b>K</b> [Ar]4s <sup>1</sup> potassium 39.10	20 <b>Ca</b> [Ar]4s <sup>2</sup> calcium 40.08	21 <b>Sc</b> [Ar]4s <sup>2</sup> 3d <sup>1</sup> scandium 44.96	22 <b>Ti</b> [Ar]4s <sup>2</sup> 3d <sup>2</sup> titanium 47.88	23 <b>V</b> [Ar]4s <sup>2</sup> 3d <sup>3</sup> vanadium 50.94	24 <b>Cr</b> [Ar]4s <sup>1</sup> 3d <sup>5</sup> chromium 52.00	25 <b>Mn</b> [Ar]4s <sup>2</sup> 3d <sup>5</sup> manganese 54.94	26 <b>Fe</b> [Ar]4s <sup>2</sup> 3d <sup>6</sup> iron 55.85	27 <b>Co</b> [Ar]4s <sup>2</sup> 3d <sup>7</sup> cobalt 58.93	28 <b>Ni</b> [Ar]4s <sup>2</sup> 3d <sup>8</sup> nickel 58.69	29 <b>Cu</b> [Ar]4s <sup>1</sup> 3d <sup>10</sup> copper 63.55	30 <b>Zn</b> [Ar]4s <sup>2</sup> 3d <sup>10</sup> zinc 65.39	31 <b>Ga</b> [Ar]4s <sup>2</sup> 3d <sup>10</sup> 4p <sup>1</sup> gallium 69.72	32 <b>Ge</b> [Ar]4s <sup>2</sup> 3d <sup>10</sup> 4p <sup>2</sup> germanium 72.58	33 <b>As</b> [Ar]4s <sup>2</sup> 3d <sup>10</sup> 4p <sup>3</sup> arsenic 74.92	34 <b>Se</b> [Ar]4s <sup>2</sup> 3d <sup>10</sup> 4p <sup>4</sup> selenium 78.96	35 <b>Br</b> [Ar]4s <sup>2</sup> 3d <sup>10</sup> 4p <sup>5</sup> bromine 79.90	36 <b>Kr</b> [Ar]4s <sup>2</sup> 3d <sup>10</sup> 4p <sup>6</sup> krypton 83.80						
37 <b>Rb</b> [Kr]5s <sup>1</sup> rubidium 85.47	38 <b>Sr</b> [Kr]5s <sup>2</sup> strontium 87.62	39 <b>Y</b> [Kr]5s <sup>2</sup> 4d <sup>1</sup> yttrium 88.91	40 <b>Zr</b> [Kr]5s <sup>2</sup> 4d <sup>2</sup> zirconium 91.22	41 <b>Nb</b> [Kr]5s <sup>1</sup> 4d <sup>4</sup> niobium 92.91	42 <b>Mo</b> [Kr]5s <sup>1</sup> 4d <sup>5</sup> molybdenum 95.94	43 <b>Tc</b> [Kr]5s <sup>2</sup> 4d <sup>5</sup> technetium (98)	44 <b>Ru</b> [Kr]5s <sup>1</sup> 4d <sup>7</sup> ruthenium 101.1	45 <b>Rh</b> [Kr]5s <sup>1</sup> 4d <sup>8</sup> rhodium 102.9	46 <b>Pd</b> [Kr]4d <sup>10</sup> palladium 106.4	47 <b>Ag</b> [Kr]5s <sup>1</sup> 4d <sup>10</sup> silver 107.9	48 <b>Cd</b> [Kr]5s <sup>2</sup> 4d <sup>10</sup> cadmium 112.4	49 <b>In</b> [Kr]5s <sup>2</sup> 4d <sup>10</sup> 5p <sup>1</sup> indium 114.8	50 <b>Sn</b> [Kr]5s <sup>2</sup> 4d <sup>10</sup> 5p <sup>2</sup> tin 118.7	51 <b>Sb</b> [Kr]5s <sup>2</sup> 4d <sup>10</sup> 5p <sup>3</sup> antimony 121.8	52 <b>Te</b> [Kr]5s <sup>2</sup> 4d <sup>10</sup> 5p <sup>4</sup> tellurium 127.6	53 <b>I</b> [Kr]5s <sup>2</sup> 4d <sup>10</sup> 5p <sup>5</sup> iodine 126.9	54 <b>Xe</b> [Kr]5s <sup>2</sup> 4d <sup>10</sup> 5p <sup>6</sup> xenon 131.3						
55 <b>Cs</b> [Xe]6s <sup>1</sup> cesium 132.9	56 <b>Ba</b> [Xe]6s <sup>2</sup> barium 137.3	57 <b>La*</b> [Xe]6s <sup>2</sup> 5d <sup>1</sup> lanthanum 138.9	72 <b>Hf</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>2</sup> hafnium 178.5	73 <b>Ta</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>3</sup> tantalum 180.9	74 <b>W</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>4</sup> tungsten 183.9	75 <b>Re</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>5</sup> rhenium 186.2	76 <b>Os</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>6</sup> osmium 190.2	77 <b>Ir</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>7</sup> iridium 190.2	78 <b>Pt</b> [Xe]6s <sup>1</sup> 4f <sup>14</sup> 5d <sup>9</sup> platinum 195.1	79 <b>Au</b> [Xe]6s <sup>1</sup> 4f <sup>14</sup> 5d <sup>10</sup> gold 197.0	80 <b>Hg</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>10</sup> mercury 200.5	81 <b>Tl</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>10</sup> 6p <sup>1</sup> thallium 204.4	82 <b>Pb</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>10</sup> 6p <sup>2</sup> lead 207.2	83 <b>Bi</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>10</sup> 6p <sup>3</sup> bismuth 208.9	84 <b>Po</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>10</sup> 6p <sup>4</sup> polonium (209)	85 <b>At</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>10</sup> 6p <sup>5</sup> astatine (210)	86 <b>Rn</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>10</sup> 6p <sup>6</sup> radon (222)						
87 <b>Fr</b> [Rn]7s <sup>1</sup> francium (223)	88 <b>Ra</b> [Rn]7s <sup>2</sup> radium (226)	89 <b>Ac~</b> [Rn]7s <sup>2</sup> 6d <sup>1</sup> actinium (227)	104 <b>Rf</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> 6d <sup>2</sup> rutherfordium (257)	105 <b>Db</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> 6d <sup>3</sup> dubnium (260)	106 <b>Sg</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> 6d <sup>4</sup> seaborgium (263)	107 <b>Bh</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> 6d <sup>5</sup> bohrium (262)	108 <b>Hs</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> 6d <sup>6</sup> hassium (265)	109 <b>Mt</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> 6d <sup>7</sup> meitnerium (266)	110 <b>Ds</b> [Rn]7s <sup>1</sup> 5f <sup>14</sup> 6d <sup>9</sup> darmstadtium (271)	111 <b>Uuu</b> (272)	112 <b>Uub</b> (277)	114 <b>Uuq</b> (296)		116 <b>Uuh</b> (298)		118 <b>Uuo</b> (?)							
Lanthanide Series*		58 <b>Ce</b> [Xe]6s <sup>2</sup> 4f <sup>1</sup> 5d <sup>1</sup> cerium 140.1	59 <b>Pr</b> [Xe]6s <sup>2</sup> 4f <sup>3</sup> praseodymium 140.9	60 <b>Nd</b> [Xe]6s <sup>2</sup> 4f <sup>4</sup> neodymium 144.2	61 <b>Pm</b> [Xe]6s <sup>2</sup> 4f <sup>5</sup> promethium (147)	62 <b>Sm</b> [Xe]6s <sup>2</sup> 4f <sup>6</sup> samarium (150.4)	63 <b>Eu</b> [Xe]6s <sup>2</sup> 4f <sup>7</sup> europium 152.0	64 <b>Gd</b> [Xe]6s <sup>2</sup> 4f <sup>7</sup> 5d <sup>1</sup> gadolinium 157.3	65 <b>Tb</b> [Xe]6s <sup>2</sup> 4f <sup>9</sup> terbium 158.9	66 <b>Dy</b> [Xe]6s <sup>2</sup> 4f <sup>10</sup> dysprosium 162.5	67 <b>Ho</b> [Xe]6s <sup>2</sup> 4f <sup>11</sup> holmium 164.9	68 <b>Er</b> [Xe]6s <sup>2</sup> 4f <sup>12</sup> erbium 167.3	69 <b>Tm</b> [Xe]6s <sup>2</sup> 4f <sup>13</sup> thulium 168.9	70 <b>Yb</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> ytterbium 173.0	71 <b>Lu</b> [Xe]6s <sup>2</sup> 4f <sup>14</sup> 5d <sup>1</sup> lutetium 175.0								
Actinide Series~		90 <b>Th</b> [Rn]7s <sup>2</sup> 6d <sup>2</sup> thorium 232.0	91 <b>Pa</b> [Rn]7s <sup>2</sup> 5f <sup>2</sup> 6d <sup>1</sup> protactinium (231)	92 <b>U</b> [Rn]7s <sup>2</sup> 5f <sup>3</sup> 6d <sup>1</sup> uranium (238)	93 <b>Np</b> [Rn]7s <sup>2</sup> 5f <sup>4</sup> 6d <sup>1</sup> neptunium (237)	94 <b>Pu</b> [Rn]7s <sup>2</sup> 5f <sup>6</sup> plutonium (242)	95 <b>Am</b> [Rn]7s <sup>2</sup> 5f <sup>7</sup> americium (243)	96 <b>Cm</b> [Rn]7s <sup>2</sup> 5f <sup>7</sup> 6d <sup>1</sup> curium (247)	97 <b>Bk</b> [Rn]7s <sup>2</sup> 5f <sup>9</sup> berkelium (247)	98 <b>Cf</b> [Rn]7s <sup>2</sup> 5f <sup>10</sup> californium (249)	99 <b>Es</b> [Rn]7s <sup>2</sup> 5f <sup>11</sup> einsteinium (254)	100 <b>Fm</b> [Rn]7s <sup>2</sup> 5f <sup>12</sup> fermium (253)	101 <b>Md</b> [Rn]7s <sup>2</sup> 5f <sup>13</sup> mendelevium (256)	102 <b>No</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> nobelium (254)	103 <b>Lr</b> [Rn]7s <sup>2</sup> 5f <sup>14</sup> 6d <sup>1</sup> lawrencium (257)								



# Acronyms

# **LIST OF ACRONYMS**

AA	Atomic Absorption Spectrophotometer
AAC	Arizona Administrative Code
AC (power)	Alternating current
AC	Acre
ACHIH	American Conference of Governmental Industrial Hygienists
ADEQ	Arizona Department of Environmental Quality
ADHS	Arizona Department of Health Services
ADRE	Average Daily Removal Efficiency
AHL	Allowable Headworks Loading
AIL	Allowable Industrial Loading
AMSA	Association of Municipal Sewage Authorities
ANSI	American National Standard Institute
APHA	American Public Health Association
APP	Aquifer Protection Permit
AS	Activated Sludge
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWQS	Aquifer Water Quality Standards
AWT	Advanced Wastewater Treatment
AWWA	American Water Works Association
AZPDES	Arizona Pollutant Discharge Elimination System
BL	Background Loading
BMPs	Best Management Practices
BNR	Biological Nutrient Removal
BOD <sub>5</sub>	Biochemical Oxygen Demand
BPJ	Best Professional Judgment
BTU	British Thermal Unit
C	Celsius
CBOD	Carbonaceous Biochemical Oxygen Demand
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act.
CFR	Code of Federal Regulations
CBOD	Carbonaceous Biochemical Oxygen Demand

# **LIST OF ACRONYMS**

CH <sub>4</sub>	Methane
CIU	Categorical Industrial User
CMOM	Capacity Management, Operations, and Maintenance
COD	Chemical Oxygen Demand
CSP	Confined Space Permit
CWA	Clean Water Act
CWT	Centralized Waste Treatment
D	Daily
DAF	Dissolved Air Flotation
DEHP	Di(2-ethylhexyl)phthalate
DF	Dilution Factor
DL	Detection Limit
DO	Dissolved Oxygen
DRO	Diesel Range Organics
EDW	Effluent Dominated Waters
EIS	Environmental Impact Statement
FDA	Food and Drug Administration
EMF	Electromotive Force or Voltage
F	Fahrenheit
FT	Fume Toxicity
GC/ECD	Gas Chromatography/Electron Capture Detector
GC/MS	Gas Chromatograph / Mass Spectrophotometer
GFAA	Graphite Furnace Atomic Adsorption
GPD	Gallons per Day
GPM	Gallons per Minute
GRO	Gasoline Range Organics
HCP&ERP	Hazard Communications Program and Emergency Response Plan
HRT	Hydraulic Retention Time
HW	Hazardous Waste
H <sub>2</sub> S	Hydrogen Sulfide
IC	Ion Chromatograph
ICP	Inductively Coupled Plasma ( Atomic Emission Spectroscopy)
IDL	Instrument Detection Limit
IEEE	Institute of Electrical and Electronics Engineers
IU	Industrial User

# LIST OF ACRONYMS

kg	Kilogram
L	Liter
Lb	Pound
lb/day	pounds per day
LEL	Lower Explosive Limit
LIMS	Laboratory Information Management System
M	Mole or Molar
MAG	Maricopa Association of Governments
MADL	Minimum Analytical Detection Limit
MAHL	Maximum Allowable Headworks Limit
MAV	Monthly Average
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MRL	Method Reporting Limit
mg	Milligram
mg/L	Milligrams per liter
MGD	Million Gallons per Day
mL	Milliliter
MLSS	Mixed Liquor Suspended Solids
MPN	Most Probable Number
MS	Mass Spectrometer
MSDS	Material Safety Data Sheet
MTBE	Methyl tetbutyl ether
ND	Non-Detected
NdeN	Nitrification/denitrification
NEPA	National Environmental Policy Act
NIOSH	National Institute of Occupational Safety & Health
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
NSPS	New Source Performance Standards
NTU	Nephelometric Turbidity Unit(s)
O&M	Operations and Maintenance
OMB	Office of Management and Budget
P	Pico, a metric prefix meaning one millionth of a millionth or one trillionth
PAC	Powdered Activated Carbon

# **LIST OF ACRONYMS**

PCB	Polychlorinated Biphenyls
ESD	Environmental Services Division
PEL	Permissible exposure limit
PQL	Practical Quantitation Limit
POC	Pollutant of Concern
POTW	Publicly Owned Treatment Works
ppb	parts per billion
ppm	parts per million
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RL	Reporting Limit
RO	Reverse Osmosis
SCADA	Supervisory Control and Data Acquisition
SCP	Spill Control Plan
SD	Standard Deviation
SDW	Safe Drinking Water
SGT-HEM	Silica Gel-Treated Hexane-Extractable Material
SIC	Standard Industrial Classification
SIU	Significant Industrial User
SOP(s)	Standard Operating Procedure(s)
SROG	Sub-regional Operating Group
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
SU	Standard Units
SVOCs	Semivolatile Organic Compounds
SWQS	Surface Water Quality Standards
TC	Total Carbon
TCE	Trichlorethylene
TDS	Total Dissolved Solids
TEC	Transportation Equipment Cleaning
TIC	Total Inorganic Carbon

## **LIST OF ACRONYMS**

TKN	Total Kjeldahl Nitrogen
TN	Total Nitrogen
TOC	Total Organic Carbon
TOMP	Toxic Organic Management Plan
TPH	Total Petroleum Hydrocarbons
TS	Total Solids
TSDF	Treatment Storage and Disposal Facility
TSS	Total Suspended Solids
TTO	Total Toxic Organics
U	Micro, a metric prefix meaning one millionth
ug/L	microgram per liter
VOC(s)	Volatile Organic Chemical(s)
WW	Wastewater
WWTP	Waste Water Treatment Plant



# Glossary

# **GLOSSARY**

Industrial wastewater pretreatment uses words and phrases that may not be readily understood by the general public. This section provides definitions for many of the terms frequently used by Compliance Academy Instructors.

**Accuracy** – Accuracy refers to the degree of difference between observed values and know or actual value in the analysis of wastewater.

**Acid** – A compound which liberates hydrogen ions, and has a pH below 7.

**Act or “the Act”** – The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 U.S.C. 1251 et.seq.

**Acute Effects** – When the effects of an exposure to a pollutant (*over a short period of time*) cause severe health effects to humans or other organisms, this condition is said to be acute (*as compared to chronic*).

**Administrator** – The Administrator of the U.S. Environmental Protection Agency.

**Agency** – The U.S. Environmental Protection Agency

**Alkalinity** – The measurement of a sample’s capacity to neutralize acid.

**Aliquot** – A portion of the sample needed to run the analysis.

**Analyte** - Parameter

**Annual Report** – A consolidated report covering the pretreatment year beginning January 1<sup>st</sup> and ending December 31<sup>st</sup> that includes information required by EPA NPDES (EPA) Permits and the AZPDES (Arizona State)Permit.

**Approval Authority** – The Director in an NPDES state with an approved State Pretreatment Program and the Administrator of the EPA in a non-NPDES state or NPDES state without an approved State Pretreatment Program.

**Approved Laboratory Procedures** – The measurements, tests, and analyses for the characteristics of water and wastes in accordance with analytical procedures as established in 40 CFR part 136 as revised, that are performed by an environmental laboratory licensed by the State. Alternative procedures may be approved by the Director in accordance with applicable federal regulations.

**Arizona Department of Environmental Quality or ADEQ** - Established by the Arizona Legislature in 1986, ADEQ administers a variety of programs to ensure the quality of Arizona's air, land and water resources.

**Atomic Weight** – The sum of the number of protons and the number of neutrons in the nucleus of an atom. Atomic weights of elements are found on the periodic tables.

**Authorized Representative of Industrial User 40 CFR 403.12(l) and (m)** – An authorized representative of an industrial user may be: principal executive officer, of at least the level of vice-president, if the IU is a corporation; a general partner or proprietor if the IU is a partnership or proprietorship,

# GLOSSARY

respectively; a duly authorized representative of the individual if such a representative is responsible for the overall operation of the facilities from which the discharge originates.

**Authorized Signatory/ Representative** -The appropriate signatory or representative authorized to sign permit applications, self-monitoring reports, and any other reports addressing Permit noncompliance or required by any enforcement action by the Control Authority.

**Average Daily Flow** – The total quantity of liquid tributary to a point divided by the number of days of flow measurement.

**Batch Discharger** – Batch dischargers collect all process wastewaters until a certain volume is reached before treating and discharging to sewer (also batch discharge).

**BAT** – The best available technology economically achievable, applicable to effluent limitations to be achieved by July 1, 1984, for industrial discharges to surface waters, as defined by Sec.304(b)(2)(B) of the CWA.

**Base** – A compound which liberates hydroxide ions, and has a pH above 7.

**Baseline Monitoring Report (BMR)** – A report which provides information to the Control Authority to document an IUs initial compliance status with a Categorical Pretreatment Standard prior to the compliance deadline. (40 CFR 403.12). All new source industrial users subject to categorical standards must submit a BMR to the Control Authority (POTW, State or EPA), at least 90 days prior to the commencement of discharge. The purpose of the BMR is to provide initial information to the Control Authority including identifying information, description of existing environmental permits, description of operations, flow measurements (estimated), and the concentration of pollutants in the waste stream (estimated). Existing sources were required to submit BMRs within 180 days after the effective date of any applicable categorical standard.

**BCT** – The best conventional pollutant control technology, applicable to discharges of conventional pollutants from existing industrial point sources, as defined by Sec. 304(b)(4) of the CWA.

**Best Management Practice(BMP)** – BMPs are activities, pollution treatment practices, or devices, prohibition of practices, general good housekeeping practices, pollution prevention, waste minimization, educational practices, maintenance procedures, and other management practices or devices to prevent or reduce the amount of pollutants entering the sanitary sewer system, surface water, air, land or groundwater. BMPs may include a structural or managerial practice or device that can help to achieve compliance.

**Biochemical Oxygen Demand (BOD)** – The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure, five (5) days at 20<sup>o</sup> centigrade expressed in terms of weight and concentration as milligrams per liter (mg/l).

**Biological Treatment** – A waste treatment process by which bacteria and other microorganisms break down complex organic or inorganic (e.g. ammonia) materials into simple, nontoxic, more stable compounds.

# **GLOSSARY**

**Blank (Field)** – Is an aliquot of analyte-free water or solvent brought to the field in sealed containers and transported back to the laboratory with the sample containers and analyzed along with the field samples.

**Blank (Method)** – Is an aliquot of analyte-free water prepared in the laboratory and analyzed by the analytical method used for field samples. Method blanks are used to test for the cleanliness of reagents, instruments, and the laboratory environment.

**Blank (Sample Preservation)** – Is an aliquot of analyte-free water (*usually distilled water*) to which a known quantity of preservative is added. This type of sample is a means of determining the level of contamination of acid and chemical preservatives after a period of use in the field.

**Blowdown** - The discharge of water with high concentrations of accumulated solids from boilers to prevent plugging of the boiler tubes and/or steam lines. In cooling towers, blowdown is discharged to reduce the concentration of dissolved salts in the recirculation cooling water. Clean “make-up” water is added to dilute the dissolved salts in the system. Blowdown also includes the discharge of condensate.

**BPT** – The best practical control technology currently available, applicable to effluent limitations to be achieved by July 1, 1977, for industrial discharges to surface waters, as defined by 304(b)(1) of the CWA.

**Bypass** – The intentional diversion of wastes from any portion of a treatment facility.

**Categorical Industrial Users (CIUs)** – A Categorical Industrial User is a facility that performs activities regulated under 40 CFR Parts 401-424 and 425-471.

**Categorical Standards** – Those standards promulgated by the EPA under authority of section 307 U.S. Code section 1317) which apply to a specific category of industrial user and which are published in 40 CFR chapter I, subchapter N (parts 405-471).

**Centralized Waste Treatment Facility** – A public or private facility which treats hazardous and other wastes. These facilities are designed to handle the treatment of specific hazardous wastes from industry. The waste waters containing the hazardous substances are transported to the facility for proper storage, treatment and disposal.

**Chain of Custody** – Written documentation, such as receipt and log book entries to show the history of possession of a sample from the time it was collected through the time it was analyzed.

**Chemical Oxygen Demand** – A measure of the oxygen-consuming capacity of inorganic and organic matter present in water or wastewater. It is expressed as the amount of oxygen consumed by a chemical oxidant during a specific test. It does not differentiate stable organic matter and thus does not necessarily correlate with biochemical oxygen demand.

**Chemical Treatment Process** – A waste treatment process which involves the addition of chemicals to achieve a desired level of effluent quality.

**Chronic Effects** – When the effect of a single or repeated exposure(s) to a pollutant causes health effects over a long period of time in humans or other organisms this is said to be a chronic condition (*as compared to acute*).

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**Chronic Violations** – Recurring effluent violations where the limit (*daily or monthly maximum*) is exceeded by any amount.

**Chronic SNC (CSNC)**- For SNC purposes, Chronic Violations are defined as sixty-six (66) percent or more of all the measurements taken during a six-month period meet or exceed the daily limit or the monthly average for the same pollutant parameter.

**City** – The City of Phoenix

**Civil Action** – A suit filed by the City against alleged violators of applicable pretreatment standards seeking injunctive relief, compliance, civil penalties and/or damages.

**Civil Penalty** – Monetary penalties assessed against an IU. Penalty calculations are formula based on the extent and type of noncompliance. Civil penalties recover the economic benefit of IU noncompliance and are set large enough to deter future noncompliance (*maximum \$25,000 per day for each violation*).

**Clarification** – Any process or combination of processes, the primary purpose of which is to reduce the concentration of suspended matter in a liquid by coagulation and settling.

**Clean Water Act (CWA)** – The Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. Section 1251 et seq.), as amended by the Clean Water Act of 1977 (Pub. L. 95-217), and the Water Quality Act of 1987 (Pub. L. 100-4).

**Code of Federal Regulations** – A publication of the United States government which contains all of the finalized federal regulations. Federal environmental regulations are found in volume 40 of the CFR and the General Pretreatment Regulations are found at 40 CFR Part 403.

**Combined Wastestream (40 CFR 403.6(e)1** - When process effluent is mixed prior to treatment with wastewaters other than those generated by the regulated process, fixed alternative discharge limits may be derived using the Combined Wastestream Formula. These alternative limits shall be applied to the mixed effluent by calculating both an alternative daily maximum value using the daily maximum values specified in the appropriate categorical pretreatment standards and an alternative consecutive sampling day average value using the monthly average values specified in the appropriate categorical pretreatment standards.

**Commercial User** – Any nonresidential user which provides a service or one connected with commerce and which is not classified as an industrial user.

**Compatible Pollutants** – Pollutants that are capable of being processed (a) by a biological wastewater treatment plant under normal loading conditions, and (b) in concentrations that are normally present in wastewater, without any detrimental effect on the plant's performance.

**Compliance** – When an industrial discharger has committed no pretreatment violations during the reporting year.

**Compliance Schedule** – A timetable established by an IU for completing those actions necessary to achieve compliance with a standard.

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**Compliance Sampling Point** – An opening in the sewer line that provides access for City and IU compliance sampling. Each point (location) is specific to the IU and identified in the discharge Permit. Compliance sampling points can be a valve, flume, weir or tank.

**Concentration Based Limit** – A limit based on the relative strength of a pollutant in a wastestream, usually expressed in mg/l or lb/gal.

**Confined Space** – A space which, by design has limited openings for entry and exit, unfavorable natural ventilation which could contain or produce dangerous air contaminants ( *or create an atmosphere of oxygen deprivation*), and which is not intended for continuous employee occupation. A permit may be required under OSHA to enter a confined space.

**Conservative Pollutant** – A pollutant found in wastewater that is not metabolized while passing through the treatment processes in a conventional wastewater treatment plant. Therefore a mass balance can be constructed to account for the distribution of the conservative pollutant. For example, a conservative pollutant may be removed by the treatment process and retained in the plant's sludge or it may leave the plant in the effluent. Although the pollutant may be chemically changed in the process, it can still be detected. Heavy metals such as cadmium and lead are conservative pollutants.

**Control Authority (403.12(a))** – The term “control authority” shall refer to a City which has an approved Pretreatment Program under provision of 40 CFR 403.11.

**Conventional Pollutants** – Those materials for which municipal wastewater treatment plants have been designed, including biodegradable organics, measured as BOD and suspended solids.

**Cooling Water** – The clean wastewater discharged from any heat transfer system such as condensation, air conditioning, cooling or refrigeration.

**Custody** – Custody refers to the process whereby an individual gains and controls possession of a sample. A sample is in custody if: 1) it is in the actual possession, control, and presence of the inspector; or 2) it is in the individual's view; or 3) it is not in the individual's presence, but is in a place of storage where only the individual has access; or 4) it is not in the individual's physical presence, but is in a place of storage and only the individual and identified other have access.

**Daily Maximum** – Is the average value of all grab samples taken during any given calendar day. If only one grab sample has been taken, that grab sample becomes the daily maximum (*as well as the instantaneous maximum*). If more than one grab sample is taken in a given day, the daily maximum is the average of all the individual grab samples. A composite sample, by definition, becomes the daily maximum for the calendar day in which it is collected.

**Daily Discharge** – The discharge of a pollutant measured during any calendar day or any 24-hour period that reasonably represents a calendar day.

**Density** – The relationship between weight and volume, e.g., grams per cubic centimeter, or pounds per gallon.

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**Detention Times** – The residence time of wastewater undergoing treatment in a treatment unit such as a clarifier or tank. Minimum detention times are required for settling, chemical treatment and biological treatment.

**Digestion** – A procedure to solubilize suspended material and to destroy possible organic-metal complexes.

**Direct Discharge** – The discharge of treated or untreated wastewater directly to the waters of the State of Arizona.

**Director** – The Water Services Director of the Water Services Department or his authorized deputy, agent, or representative.

**Domestic Waste** – A typical residential-type waste which requires no pretreatment before discharging into the sewer system excluding all commercial, manufacturing and industrial wastes.

**Doppler Flow Meter** – An ultrasonic flow meter that measures the velocity of liquid in a pipe flowing full.

**Duplicate Recovery** – The percent of a spike recovered during analysis.

**Duplicate Sample (Field)**– Is a precision check on sampling equipment and sampling technique. At selected stations on a random time frame duplicate samples are collected from two sets of field equipment installed at the site, or duplicate grab samples are collected from a single piece of equipment at the site.

**Duplicate Sample (Laboratory)**– A sample which is received by the laboratory and divided (*by the laboratory*) into two or more portions. Each portion is separately and identically prepared and analyzed. The results from laboratory duplicate samples check the laboratory precision.

**Effluent** – Wastewater or other liquid raw, untreated, partially or completely treated flowing from an IU to a reservoir, basin, treatment process or treatment plant.

**Electroplating** – The process for applying a thin metal coating to the surface of a metal (substrate) by electrodeposition of dissolved metal in a plating solution.

**Environmental Protection Agency, or EPA** – The U.S. Environmental Protection Agency.

**Enforcement Response Plan (ERP)** – The Enforcement Response Plan for the City of Phoenix contains detailed procedures identifying how the Environmental Services Division will investigate and respond to instances of IU noncompliance.

**Equipment Blank** – Is a volume of analyte-free water that is taken into the field and opened on site. The contents of the blank are poured or pumped appropriately over or through the sample collection device.

**Facility** – All contiguous property owned, operated, leased or under the control of the same person or entity.

# GLOSSARY

**Existing Source** – Any source of discharge, the construction or operation of which commenced prior to the publication by the EPA of proposed categorical pretreatment standards, which will be applicable to such source if the standard is thereafter promulgated in accordance with Section 307 of the Act.

**Federal Categorical Pretreatment Standard** – Any regulation containing pollutant discharge limits promulgated by the EPA in accordance with Section 307(b) of the Act (33 U.S.C. 1347) which applies to a specific category of IUs. These standards are derived on the basis of best available treatment technology economically achievable and vary by industry category.

**Flow Equalization** – Temporary storage of wastewater flow to provide more uniform flow or waste characteristics for treatment or discharge.

**Flow Meter** - Flow meters measure the depth of a liquid at a designated point behind a hydraulic structure (a weir or flume) using various means (bubblers, ultrasonic, float, and differential pressure are common methods). This depth is converted to a flow rate according to a theoretical formula of the form  $Q=KH^X$  where Q is the flow rate, K is a constant, H is the water level and X is an exponent which varies with the device used, or it is converted according to empirically derived level/flow data points (a 'flow curve'). The flow rate can then be integrated over time into volumetric flow. Flow can also be calculated using velocity. Velocity times the cross-sectional area yields a flow rate which can be integrated to volumetric flow.

**Flow-Proportional Composite Sample** – A mixed sample composed of single samples whose volumes are proportional to the wastewater flow at the time of sampling.

**Flow Systems**– Closed Channel flow is flow in completely filled pressure conduits (pipes) and usually measured by some type of device inserted into the line. Open Channel flow is flow in any channel in which the liquid flows with a free surface (ditches, canals, flumes) and usually measured by inserting a hydraulic structure (flume, weir etc.).

**Flume** – An open conduit of wood, masonry, plastic or metal specially shaped to increase velocity and change the level of the liquid flowing through the flume (*Parshall, Palmer-Bowlus, Trapezoidal etc.*).

**Free Access** – The ability of City personnel to enter user facilities under safe and non-hazardous conditions with a minimum of delay to inspect any and all parts of the user's facility.

**Generator** – A person who generates septage.

**Grab Sample** – A single sample taken from a waste stream without regard to the flow in the wastestream and over a period of time not to exceed 15 minutes.

**Hand Composite Sample** – A series of time proportional grab samples collected at equal intervals and equal volumes that are composited by hand.

**Hazardous Substances (Materials)** – Any substances or combination of substances that present or pose potential dangers to human health and safety or to living organisms in the environment. The dangers may be short term or cumulative.

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**Hazardous Waste** – For a waste to be considered a hazardous waste it must first be designated a solid waste. Virtually all forms of wastes are considered to be solid wastes (including solids, liquids, semi-solids, and contained gaseous materials) except those expressly excluded under the regulatory definition, e.g., industrial effluent which is mixed with sanitary wastes in the sewer. For a solid waste to be considered hazardous it must meet one of the two criteria: 1) it has one of the following four characteristics – ignitability, corrosivity, reactivity, or toxicity (*according to the Toxicity Characteristic Leaching Procedure*). or 2) it must be a listed hazardous waste in 40 CFR 261.31-261.33. Any waste, including wastewater, defined as hazardous under RCRA, TSCA, or any state law.

**Head Loss** – (1) The decrease in energy head between two points resulting from friction, bends, obstructions, expansion, or other causes. (2) the difference between the total heads at two points in a hydraulic system.

**Holding Tank Waste** – Any waste from holding tanks such as vessel, chemical toilets, campers, trailers, septic tanks, and vacuum-pump tank trucks.

**Holding Time** – The maximum time allowed between when a sample is taken and when it must be analyzed in the laboratory in accordance with standard preservation, storage and analytical procedures.

**Hydrogen Sulfide (H<sub>2</sub>S)** – Dissolved Sulfide is produced by the biological reduction of sulfate and organic matter under anaerobic (oxygen free) conditions. Dissolved sulfide can combine with hydrogen to form hydrogen sulfide gas. H<sub>2</sub>S gas is potentially hazardous to sewer maintenance workers.

**Incompatible Pollutants** – See: Noncompatible Pollutants

**In-Compliance** – The concentrations of pollutants in an industrial user's discharges to a POTW are within pretreatment standards and all pretreatment requirements are being met over the long term.

**Industrial Wastewater** – Any non-domestic wastewater (excluding storm water).

**Inflow** – Water other than wastewater that enters a sewerage system from sources such as roof leaders, cellar drains, foundation drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catchbasins, cooling towers, storm waters, surface runoff, street wash water or drainage.

**Influent** – Wastewater or other liquid raw (untreated), partially or completely treated flowing into a reservoir, basin, treatment process or treatment plant.

**Indicator Organism** – An organism that is used to indicate the possible presence of pathogenic organisms and fecal pollution.

**Indirect Discharge** – The discharge or the introduction of nondomestic pollutants from any source regulated under Section 307(b) or (c) of the Act, (33 U.S.C. 1317), into the POTW (including holding tank waste discharge into the system). Also Non-Point Discharge

**Industrial Discharge** – Any introduction into the POTW of a nondomestic pollutant which is produced by a source that is subject to any categorical standards or

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pretreatment requirements and which contains any substance or pollutant for which a discharge limitation or prohibition has been established by any categorical standard or pretreatment requirement.

**Industrial User** – Any nonresidential user of the sewer system which discharges more than the equivalent of 25,000 gallons per day of domestic wastes, or which is subject to any categorical standard or pretreatment requirement.

**Industrial Waste** – The liquid waste from any industrial or manufacturing process, as distinct from domestic or sanitary waste.

**Inspection** – A visual observation/evaluation of IU equipment, operations, sampling activities and accuracy of IU performance and compliance records

**Instantaneous Effluent Limitation** – The maximum allowable concentration in the discharge at any time as measured in a grab sample.

**Interference** – The inhibition or disruption of the POTW treatment processes or operations which contributes to a violation of any requirement of the City's NPDES Permit. The term includes prevention of sewage sludge use or disposal by the POTW in accordance with 405 of the Act (33 U.S.C. 1345) or any criteria, guidelines, or regulations developed pursuant to the Solid Waste Disposal Act (SWDA), the Clean Air Act, the Toxic Substances Control Act, or more stringent state criteria (including those contained in any State sludge management plan prepared pursuant to Title IV of SWDA) applicable to the method of disposal or use employed by the POTW.

**Instrument Detection Limit (IDL)** – The smallest signal above a background noise that an instrument can detect reliably.

**Limit Violation** – Pollutant concentration is above the allowable limit as defined in the pretreatment standards for a particular IU.

**Long Term Average (LTA)** – For purposes of the effluent guidelines, average pollutant levels achieved over a period of time by a facility, subcategory, or technology option.

**Magnetic Flow Meter** – A flow meter that creates a magnetic field across a pipe flowing full, in which the liquid acts as a conductor, to measure the velocity and flow in the pipe.

**Maintenance** – Keeping pretreatment equipment in a state of repair, including expenditures necessary to maintain capacity.

**Mass Based Limit** – A limitation based on the actual quantity of a pollutant in a wastestream, usually expressed in mg/square meter of operation (*lb/square foot of operation*).

**Mass Emission Rate** – The rate of discharge of the dry weight of a pollutant in wastewater or air, expressed in pounds per day (lb/day), or kilograms per day (kg/day).

**Material Safety Data Sheets** – Provide information about manufactured chemicals as required by the Hazard Communications Rule.

**Metal Bearing Wastes** – Wastes and/or materials that contain significant quantities of metal pollutants, but not significant quantities of oil and grease (generally less than 100

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mg/l), from manufacturing or processing facilities or other commercial operations. These wastes include, but are not limited to, spent electroplating baths and sludges, metal finishing rinse water and sludges, chromate wastes, air pollution control blow down water and sludges, spent anodizing solutions, incineration air pollution control wastewaters, waste liquid mercury, cyanide containing wastes greater than 136 mg/l, and waste acids and bases with or, in the case of acids and bases only, without metals.

**Minimal Level** – The lowest level at which the entire analytical system must give a recognizable signal and an acceptable calibration point for the analyte.

**Molarity** – Moles per liter, a measure of concentration.

**Molecular Weight** – The sum of the atomic weights of all atoms making up a molecule.

**Monitoring** – The practice of investigating, surveying, and sampling wastewater sources in an effort to obtain information on the quality and quantity of the wastewater flow.

**Monthly Average** – The monthly average is the arithmetic average value of all samples taken in a calendar month for an individual pollutant parameter. The monthly average may be the average of all grab samples taken in a given calendar month, or the average of all composite samples taken in a given calendar month.

**National Pollutant Discharge Elimination System (NPDES)** – A system of permits to discharge wastewaters to navigable waters developed under the authority of Section 402 of the Act (33 U.S.C. 1342).

**National Prohibited Discharges** – Prohibitions applicable to all nondomestic dischargers regarding the introduction of pollutants into POTWs set forth at 40 CFR 403.5.

**Neutralization** – Addition of an acid or alkali (base) to a liquid to cause the pH of the liquid to move toward a neutral pH of 7.0.

**New Sources** – Any source, the construction of which is commenced after the publication of proposed regulations prescribing a Section 307 (33 U.S.C. 1317) Categorical Pretreatment Standard which will be applicable to such source, if such standard is thereafter promulgated within 120 days of proposal in the Federal Register. Where the standard is promulgated later than 120 days after proposal, a new source means any source, the construction of which is commenced after the date of promulgation of the standard.

**Normality** – Equivalent per liter. A measure of concentration.

**NSPS** – New Sources Performance Standards, applicable to industrial facilities whose construction is begun after the publication of the proposed regulations, as defined by Sec 306 of the CWA.

**90 Day Compliance** – A report submitted by categorical industrial users within 90 days following the date for final compliance with the standards. This report must contain flow measurement ( or regulated process streams and other streams) measurement of pollutants, and a certification as to whether the categorical standards are being met.

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**Nominal Quantitation Limit** – The smallest quantity of an analyte that can be measured reliably with a particular analytical method.

**Noncompatible Pollutants** – Parameters that are not able to be handled under normal loading conditions in biological waste treatment plants and may in fact be detrimental to the biota of these plants.

**Noncontact Cooling Water** – Water used for cooling which does not come into direct contact with any raw material, intermediate product, waste product, or finished product.

**Non-conventional Pollutants** – Pollutants that are neither conventional pollutants nor priority pollutants listed at 40 CFR Section 401.

**Non-detect Value** – The analyte is below the level of detection that can be reliably measured by the analytical method. This is also known, in statistical terms, as left-censoring.

**Notice of Violation (NOV)** – A written enforcement action notification issued to an IU for violations of pretreatment standards or requirements.

**Notice to Show Cause** – A meeting between the City (ESD) and an IU generally held when more aggressive enforcement action is required. The IU must “show cause” as to why the City should not initiate additional enforcement actions or progress to discontinuation of sewer service.

**NPDES Permit** – A National Pollutant Discharge Elimination System permit is the regulatory document issued by either the EPA or approved State agency. The permit is designed to control the discharge of pollutants from point sources into waters of the U.S.

**Oil and Grease** – The measure of oil and grease content of a sample as determined by EPA Method 1664A or other equivalent test method approved by the Director.

**Oily Wastes** – Wastes and/or used materials that contain oil and grease (generally at or in excess 100 mg/l) from manufacturing or processing facilities or other commercial operations. These wastes include, but are not limited to used oils, oil-water emulsions or mixtures, lubricants, coolants, contaminated groundwater clean-up from petroleum sources, used petroleum products, oil spill clean-up, bilge water, rinse/wash waters from petroleum sources, interceptor wastes, off-specification fuels, underground storage remediation waste, and tank clean out from petroleum or oily sources.

**Open-channel Flow** – Flow of a fluid with its surface exposed to the atmosphere. The conduit may be an open channel or a closed conduit flow by gravity.

**Organic Bearing Wastes** – Wastes and/or used materials that contain organic pollutants, but not a significant quantity of oil and grease (generally less than 100 mg/l), from manufacturing or processing facilities or other commercial operations. These wastes included, but are not limited to, landfill leachate, contaminated groundwater clean-up from non-petroleum sources, solvent-bearing wastes, off-specification organic product, still bottoms, waste byproduct glycols, wastewater from paint washes, wastewater from adhesives and/or epoxies formulation, wastewater from chemical product operations, and tank clean-out from organic, non-petroleum sources.

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**Organic Matter** – Any substance composed of chemical compounds which consist primarily of carbon.

**Oxidation-Reduction** – Reactions involving the transfer of electrons, with oxidation being loss of electrons. ORP or oxidation-reduction potential, is the qualitative measure of the state of oxidation in metal waste treatment systems. ORP is used to control the chemical addition to optimize the oxidation of compounds such as cyanide or reduction of metals such as hexavalent chromium.

**Parameter Violation** – A pre-established limit for a particular pollutant has been exceeded, resulting in an unlawful wastewater discharge to the sanitary sewer.

**Parshall Flume** – A calibrated device developed by Ralph L. Parshall for measuring the flow of liquid in an open conduit. It consists essentially of a contracting length, a throat, and an expanding length. At the throat is a sill over which the flow passes at critical depth.

**Pass Through (40 CFR 403.3(n)1** – A discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW NPDES permit (including an increase in the magnitude or duration of a violation) or which causes or contributes to a violation of an applicable numeric or narrative water quality standard.

**Periodic Compliance Report (403.12(e)1** – A report submitted at least twice annually by each significant industrial user regulated under the local pretreatment program which indicates the nature and concentration of pollutants in the effluent which are limited by applicable pretreatment standards. In addition, the periodic report must indicate a record of measured or estimated average maximum daily flows for the reporting period.

**Permit** – A written (control) enforcement mechanism for controlling industrial wastewater discharges. Permits contain effluent limitations, monitoring and reporting requirements, compliance schedules and standard conditions relating to facility operations & ownership.

**Permittee** – Any person firm, association, corporation, or trust which owns, operates, processes or controls an establishment or plant being operated under a valid permit to discharge wastewater into the City sewer system.

**pH** – pH is an expression of the concentration of hydrogen ions in solution. The measurement indicates an acid solution when the pH is <7 and an alkaline solution when the pH is > 7. pH meters typically measure the pH in the range of 0 to 14. The concentration is the weight of hydrogen ions, in grams per liter of solution. Neutral water, for example, has a pH value of 7 and hydrogen ion concentration of  $10^{-7}$ . pH reflects the negative logarithm of the hydrogen ion concentration of the aqueous solution..

**pH Continuous** – Unattended pH (a conventional pollutant) monitoring at the compliance point using an electrometric pH sensor mounted at and immersed in the discharge wastestream.

**Physical Waste Treatment Process** – Physical wastewater treatment processes include racks, screens, comminutors, clarifiers, (sedimentation & flotation), and filtration, which through physical actions remove pollutants from the wastewater.

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**Pickle** – An acid or other chemical solution in which metal objects are dipped to remove oxide scale or other adhering substances.

**Point Source** – Any facility having a connection to the public sewer.

**Pipeline** – “Pipeline” means an open or closed conduit used for the conveyance of material. A pipeline includes a channel, pipe, tube, trench, ditch or fixed delivery system.

**Pollutant** – Any dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat wrecked or discharged equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.

**Pollutants of Concern (POC)** – Compounds in wastewater that pose a potential threat to the POTW or its ability to comply with environmental standards.

**Pollution Prevention** – Source reduction and other practices that reduce or eliminate the creation of pollutants.

**(POTW) Publicly Owned Treatment Works**– A treatment works as defined by Section 212 of the Act, (33 U.S.C. 1292) which is owned, in this instance, by the City. This definition includes any sewers that convey wastewater to the POTW treatment plant, but does not include pipes, sewers or other conveyances not connected to a facility providing treatment. For the City of Phoenix, “POTW” also includes any sewers that convey wastewaters to the POTW from persons outside the City who are, by contract or agreement with the City, users of the City’s POTW.

**Precipitation** – The phenomenon that occurs when a substance (solute) held in solution in a liquid passes out of solution into solid form, usually precipitated by the addition of another substance that chemically transforms the solute into an insoluble form that can be removed by filtration or settling during a treatment process.

**Precision** – Precision refers to the reproducibility of the laboratory analytical results.

**Pretreatment Standard** – Any regulation promulgated by the EPA in accordance with Section 307(b) and (c) of the Clean Water Act which applies to a specific category of industrial users and provides limitations on the introduction of pollutants into POTWs. This term includes the prohibited discharge standards under 40 CFR 403.5, including [40 CFR 403.3 (j)].

**Primary Measuring Device** – A hydraulic structure to measure flow in an open channel there are two types, weirs and flumes.

**Printed Circuit Board** – A circuit for electronic apparatus made by depositing conductive material, usually copper, on an insulating surface.

**Priority Pollutant** – One hundred twenty-six compounds that are a subset of the 65 toxic pollutants and classes of pollutants outlined in Section 307 of the CWA. The priority pollutants are specified in the NRDC settlement agreement (National Resources Defense Council et al v. Train, 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]).

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**Pretreatment or Treatment** – The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater to a less harmful state prior to or in lieu of discharging or otherwise introduction of such pollutants into a POTW. The reduction or alteration can be obtained by physical, chemical, or biological processes, process changes, or other means, except as prohibited by 40 CFR Section 403.6(d).

**Pretreatment Facility** – Industrial wastewater treatment system consisting of one or more treatment devices designed to remove sufficient pollutants from waste streams to allow an industry to comply with effluent limits (i.e. categorical standards, local limits, and federal prohibitive standards).

**Pretreatment Standard** – Any industrial discharge pollutant limitation imposed on an industrial user by local ordinance or by EPA.

**Pretreatment Year** – A pretreatment year begins January 1<sup>st</sup> and ends December 31<sup>st</sup>

**Priority Pollutants (Priority Toxic Pollutants) (40 CFR 423 Appendix A1)** – A list of specific compounds, originally identified by EPA in Section 307(a) of the Act for initial development of categorical pretreatment. There are 65 classes of pollutants and 126 individual pollutants currently identified.

**Process Inhibition** – The concentration of a pollutant that will interfere with a biological treatment process in the POTW.

**Process Wastewater (40 CFR X22.21)** – Is any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

**Prohibited Materials** – Any materials that are barred from being discharged into a POTW by local ordinance.

**PSNS** – Pretreatment standards for new sources of indirect discharges, under Sec. 307(b) of the CWA.

**Quality Assurance / Quality Control (QA/QC)** – Quality Assurance is the program function specified to assure the quality of measurement data, while Quality Control is the process carrying out those procedures stated in the Quality Assurance program.

**RCRA** – The Resource Conservation and Recovery Act of 1976 (RCRA) (42 U.S.C. Section 6901et.seq.), which regulates the generation, treatment, storage, disposal, or recycling of solid and hazardous wastes. The Federal Resource Conservation and Recovery Act (PL 94-580). RCRA was enacted to define a federal role in solid waste and resource management and recovery. RCRA's primary goals are; 1) to protect human health and the environment from hazardous and other solid wastes; and 2) to protect and preserve natural resources through programs of resource conservation and recovery. Its principal regulatory focus is on the control of hazardous waste through a comprehensive system of identification, tracking, treatment, storage, and ultimate disposal.

**Receiving Water** – A water course, lake, or ocean into which treated water is discharged.

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**Rectangular Weir** – Weir having a notch that is rectangular in shape.

**Regulated Process** – An industrial process for which federal categorical standards are established for the wastewater discharges resulting from the industrial process.

**Removal Credits** – A term used to describe the allowance of a publicly owned treatment works to revise federal categorical pretreatment standards to reflect removal of a pollutant through the system. Authorization to grant such removal credits depends on compliance with a number of conditions, as set forth in Section 403.7 of 40 CFR, Part 403, published on January 28, 1981, in 46 FR 9443.

**Recycling** – A material is recycled if it is used, reused, or reclaimed.

**Representative Sample** – A composite sample obtained by flow proportional sample techniques where feasible. When the Director determines that flow-proportional composite sampling is infeasible, the Director may allow or conduct time-composite techniques or by the compositing or averaging of one or more grab samples.

**Reporting Violation** – Failure of an industrial user to submit the required report to the Approval Authority or Control Authority.

**Review Meeting** – A compliance status meeting between ESD staff and an IU to review violations and allow the IU to describe the means to prevent future violations.

**Receiving Water** – A stream, lake, river, ocean, or other surface or groundwater into which treated or untreated wastewater is discharged.

**Rolling Six Month Evaluation** – A rolling six month evaluation uses sample data based on calendar quarters to calculate SNC during a rolling six month window. Under this procedure each SIU is evaluated for SNC four times during a fifteen month window. Of the eight criteria that must be evaluated for SNC only Chronic SNC and Technical Review Criteria SNC are evaluated based on a six month rolling window. All other criteria are strictly on a calendar quarter.

**Sampler** – A device used with or without flow measurement to obtain a sample portion of water or waste for analytical purposes. May be designed for taking a single (grab) sample, time composite sample, or flow-proportional composite sample.

**Sampling** – The practice of collecting samples of wastewater discharges for analysis of wastewater characteristics.

**Sample-specific Quantitation Limit** – The smallest quantity in the experimental calibration range that may be measured reliably in any given sample.

**Sanitary Sewer** – A sewer that carries liquid and water-borne wastes from residences, commercial buildings, industrial plants, and institutions, together with minor quantities of ground, storm, and surface waters that may be admitted unintentionally.

**Septage** – Aerobic wastewater originating from a domestic source, be it from a residential, commercial, or industrial facility, that is not hazardous waste and is compatible with the biological wastewater treatment plant process.

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**Settling** – Treatment process by which settleable or floatable solids are removed from wastewater by gravity separation in a tank or other vessel.

**Sewage** – A combination of water-carried wastes from residences, business buildings, institutions, and industrial establishments, together with such ground waters, surface waters, and storm waters as may be present.

**Sewer** – A pipe or conduit for carrying sewage.

**Sewer Tap** – The wye, saddle or other device placed on a public sewer to receive a building connection.

**Sewer Use Ordinance** – A sewer use ordinance is a legal instrument implemented by a local government entity which sets out all the requirements for the discharge of pollutants into a publicly owned treatment works.

**Significant Noncompliance (SNC)** – One or more serious violations or a pattern of minor violations. An IU may be considered in SNC when violations are Chronic Violations (CSNC) or Technical Review Criteria Violations (TRCSNC) or late reporting.

**Significant Violation** – A major discharge of pollutants to the POTW system that is determined to be grossly over the limits of pretreatment standards for that industry.

**Significant Industrial User - (1)** An IU subject to Categorical Pretreatment Standards 40 CFR 403.6 and 40 CFR, Chapter I subchapter N. Any industry that falls under these categories is considered a SIU whether it has process discharge to the sewer or not.  
**(2)** Any industry which discharges an average of 25,000 gallons per day or more of process wastewater to the sewer system (excluding sanitary, noncontact cooling water and boiler blowdown wastewater).  
**(3)** Any industry designated as such on the basis that the IU has a reasonable potential for adversely affecting the POTW.

**Sludge** – The settleable solids intentionally separated from liquid waste streams during treatment typically under quiescent conditions, and the unintentional accumulation of solids in tanks and reservoirs associated with production and manufacturing processes.

**Slug Discharge (40 CFR 403.8(f)(2)(v)1** – Any pollutant discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge. Any discharge at a flow rate or concentration which would cause a violation of the prohibited discharge standards in the General Pretreatment Regulations.

**Sludge Control Plan (40 CFR 403.8(f)(2)(v)1** – A plan designed to prevent the uncontrolled discharge of raw pollutants (*or materials, e.g., a dairy spill of milk may disrupt a small POTW and would have to be reported even though milk is not a "pollutant"*) into the POTW. Every Significant Industrial User is required to be evaluated at least every two years, for the necessity of instituting such a control plan.

**Sludge Quality Standard** – Allowable concentration or mass of a pollutant in POTW sludge, or biosolids, used for land application.

**Source Reduction** – Any practice which reduces the amount of any pollutant or contaminant entering any waste stream or otherwise released into the environment or

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reduces hazards to public health and the environment associated with the release of such substances, pollutants or contaminants.

**Specific Gravity** - (1) Weight of a particle, substance, or chemical solution in relation to the weight of an equal volume of water. Water has a specific gravity of 1.000 at 4<sup>o</sup> C (39<sup>o</sup> F). (2) Weight of a particular gas in relation to an equal volume of air at the same temperature and pressure ( air has a specific gravity of 1.0). Chlorine has a specific gravity of 2.5 as a gas.

**Spiked Sample (Field)** – A sample of a known amount of a particular pollutant constituent prepared in the field by adding a known amount of the analyte in question during sampling. This technique identifies potential sample matrix interference and/or problems with inadequate sample preservation.

**Spiked Sample (Laboratory)**– A sample of a known amount of a particular pollutant constituent prepared in the laboratory by adding a known amount of the analyte in question at a concentration where the accuracy of the test method is satisfactory. Spiked samples check on the accuracy of the analytical procedure.

**Split Samples** – A sample which is collected and divided in the field into the necessary of portions (e.g., 2, 3, etc.) for analysis. Equally representative samples must be obtained in the process. The split samples are then analyzed by separate laboratories (*or the same laboratory*), preferably using the same analytical techniques.

**SROG** – Sub-regional Operating Group formed in 1979 pursuant to a joint exercise of powers agreement between the cities of Glendale, Mesa, Phoenix, Scottsdale, and Tempe, and the Town of Gilbert to jointly own and operate the 23<sup>rd</sup> and 91<sup>st</sup> Avenue Wastewater Treatment Plants and their interceptor systems. Intergovernmental agreements exist between SROG members and non-SROG jurisdictions which allow third parties to discharge to the SROG system.

**Standard Industrial Classification (SIC)** – A classification pursuant to the Standard Industrial Classification Manual issued by the Executive Office of the President, Office of Management and Budget, 1972. Codes used to categorize and uniquely identify business and economic activities.

**Standard Methods** – The procedure as described in the most current edition of Standard Methods for the Examination of Water and Wastewater published by American Health Association, or the most current edition of Manual of Methods for Chemical Analysis for Water and Wastes published by the EPA.

**Stilling Well** – A pipe, chamber, or compartment with comparatively small inlets, or with inlets communicating with a main body of water. Its purpose is to dampen waves or surges while permitting water level within the well to rise or fall with the major fluctuation of the main body of water. It is used with water measuring devices to improve accuracy of measurement.

**Storm Water** – Any flow occurring during or following any form of natural precipitation and resulting there from.

**Storm Sewer / Storm Drain** – A sewer which carries storm and surface waters and drainage, but excludes sewage and polluted industrial wastes.

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**Suspended Solids** – The total suspended matter that floats on the surface of, or is suspended in, water, wastewater or other liquids, and which is removable by laboratory filtering.

**Subchapter N** – Refers to Subchapter N of Chapter I of Title 40 of the Federal Regulations. This includes, but is not limited to, the industrial categorical standards included in 40 CFR Parts 405 through 471.

**Technical Review Criteria Violations (TRC) (TRCSNC)** – (1) Technical Review Criteria Violations are recurring effluent violations where the limit is exceeded by a certain statistically developed percentage so as to account for the degree of variance from the pretreatment standards. (2) For Technical Review Criteria Significant Noncompliance (TRCSNC), thirty-three (33) percent or more of all of the measurements taken during a six-month period equal or exceed the product of the daily limit or the monthly average limit multiplied by the applicable TRC (1.4 for BOD, TSS, fats, oil & grease and 1.2 for all other pollutants except pH).

**Technology Based Standards** – Discharge limits for specific industrial categories established by the Federal EPA based on the use of the Best Available Technology economically achievable (BAT), the Best Practicable Control Technology available (BPT), or the Best Conventional Technology available (BCT). Such standards are based on the cost and/or availability of technology to treat the specific wastestream under consideration.

**Termination of Service** – An administrative action implemented by the City to halt any actual or threatened discharge to the sewer from an IU that has failed to adequately respond to previous enforcement actions.

**Time Composite Sample** – A mixed sample composed of single equal-volume samples collected at selected regular intervals over a specified period of time.

**Total Organic Carbon (TOC)** – The total of all organic compounds expressed in milligrams per liter as determined by the combustion-infrared method prescribed by approved laboratory procedures.

**Total Suspended Solids (TSS)** – Residue that is removed from a wastewater sample by a standard laboratory filtration procedure, expressed as mg/L.

**Total Toxic Organics (TTO)** – The summation of all quantifiable values of toxic organics greater than 0.01 mg/l contained in the Federal Categorical Pretreatment Standards.

**Toxic Pollutant (40 CFR 122 Appendix D)** – Any pollutant or combination of pollutants listed as toxic in regulations promulgated by the Administrator of the Environmental Protection Agency under the provision of CWA 307(a) or other Acts. Those pollutants, or combination of pollutants, including disease-causing agents which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism either directly from the environment or indirectly by ingestion through the food chain, will on the basis of information available to the Administrator of the EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, (including malfunctions in reproduction) or physical deformation

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**Treatment** – Any method, technique, or process designed to change the physical, chemical or biological character or composition of any metal-bearing, oily, or organic waste so as to recover metal, oil, or organic content from wastes.

**Trip Blank** – Is a volume of analyte-free water brought to the field in sealed containers and transported back to the lab with the actual sample containers.

**Turbine Meter** – A positive displacement meter with an internal turbine turned by the water flow. Flow is proportional to turbine rotation speed.

**User** – Any person who contributes, causes or permits the contribution of wastewater into the City's POTW.

**Variability Factor** – Used in calculating a limitation (or standard) to allow for reasonable variation in pollutant concentrations when processed through extensive and well designed treatment systems. Variability factors assure that normal fluctuations in a facility's treatment are accounted for in the limitations.

**Violation** – Whenever a user exceeds an applicable effluent limit; fails to meet the deadlines and conditions for reporting, monitoring or treatment; or does not comply with other Federal or City requirements.

**V-notch Weir** – A triangular sharp-crested weir for measurement of liquid discharge in open channels.

**Volatile Solids** – The quantity of solids in water, wastewater, or other liquids, lost on ignition of the dry solids at 600<sup>o</sup>.

**Waste** – Includes aqueous, non-aqueous, and solid waste, wastewater, and/or used material.

**Wastewater** – The liquid and water-carried industrial or domestic wastes from dwellings, commercial buildings, industrial facilities, and institutions, whether treated or untreated, which is introduced into the POTW.

**Water Quality Standards** – Water quality standards are provisions of state or federal law which consist of a designated use or uses for a given water body and associated water quality criteria which must be met in the stream to achieve these uses. Water quality standards are effluent standards imposed on point sources. These standards are designed to achieve the water quality criteria established for a given water body. These standards are designed to improve and/or maintain the quality of the receiving water, regardless of the cost or availability of treatment technology.

**Weir** – (1) A diversion dam. (2) A device that has a crest and some side containment of known geometric shape and is used to measure flow of a liquid. The liquid surface is exposed to the atmosphere. Flow is related to: upstream height of water above the crest, position of crest with respect to downstream water surface, and geometry of the weir opening. Most common types are rectangular weirs, trapezoidal (Cipolletti) weirs and triangular (V-notch) weirs.

**Worker Right to Know Laws** – Employee "Right-to-Know" legislation requires employers to inform employees (e.g., treatment plant operators) of the possible health effects resulting from contact with hazardous substances. At location where this

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legislation is in force, employers must provide employees with information regarding any hazardous substances which they might be exposed to under normal working conditions or reasonably foreseeable emergency conditions resulting from workplace conditions. OSHA's "Hazard Communication Standard (HCS)" (Title 29 CFR Part 1910.1200) is the federal regulation and state statutes are called "Right to Know Laws."

**Zero Process Discharge** – This term applies to those users that only discharge domestic wastes or have no discharge, but have significant quantities of hazardous materials or high strength waste which, if discharged, would be regulated by this ordinance. Such facilities may be regulated by requiring them to have zero discharge of process wastes, thus allowing only domestic wastes to be discharged. No discharge of pollutants to waters of the United States or to a POTW. Also included in this definition are disposal of pollutants by way of evaporation, deep-well injection, off-site transfer, and land application.

## Pretreatment Point Source Categories

EPA has developed regulations for over twenty industrial categories which are based on the wastewater effluent quality that can be achieved using established treatment technologies. Specific regulations and effluent limitations are set for each industrial category. The following categories are currently regulated; however, the EPA may add or delete categories in the future. Further information regarding a specific category's regulations can be obtained by contacting the Environmental Services Division Industrial Pretreatment Program (IPP) Section.

**1. Aluminum Forming (40 CFR 467):** EPA defines aluminum forming as "the deformation of aluminum or aluminum alloys into specific shapes by hot or cold working such as rolling, extrusion, forging, and drawing." Surface treatment and heat treatment of aluminum parts that are formed at the same plant site are subject to the Aluminum Forming Regulations and are not covered by the Electroplating and Metal Finishing regulations (40 CFR 413 & 433). Casting of aluminum that is subsequently formed at the same plant site is also subject to the Aluminum Forming Regulations. Discharge from the forming operation is not required to be subject to this regulation.

**2. Battery Manufacturing (40 CFR 461):** Battery manufacturing encompasses the production of modular electric power sources where all or part of the fuel is contained within the unit and electric power is generated directly from a chemical reaction rather than indirectly through a heat cycle engine.

**3. Carbon Black Manufacturing (40 CFR 458):** This category consists of facilities which manufacture carbon black by the furnace, thermal, channel or lamp processes. Only facilities which have been constructed or significantly modified since May 18, 1976 are regulated.

**4. Centralized Waste Treatment (40 CFR 437):** This category consists of facilities that receive wastes from off-site for treatment.

**5. Coil Coating (40 CFR 465):** EPA regulations state that "Coil coating consists of that sequence or combination of steps or operations which clean, surface or conversion coat, and apply an organic (paint) coating to a long thin strip or coil of metal."

**6. Can Making (40 CFR 465):** This classification is a subcategory of coil coating and has been defined to be "the process or processes used to manufacture a can from a base metal, including aluminum and steel." This category applies to seamless cans only.

**7. Copper Forming (40 CFR 468):** This category regulates discharges resulting from the manufacture of formed copper and copper alloy products. The forming operations covered are hot rolling, cold rolling, drawing, extrusion, and forging. Ancillary operations which include surface treatment (pickling, tumbling, burnishing, alkaline cleaning, and surface milling), heat treatment, hydrotesting, sawing, and surface coating with molten metal are also covered by this regulation. Discharge from the forming operation is not required to be subject to this regulation.

**8. Electrical and Electronic Components (40 CFR 469):** This category consists of all operations associated with the manufacturing of semiconductors, electronic crystals, cathode ray tubes, and luminescent materials except for sputtering, electroplating, and vapor plating operations.

**9. Electroplating (40 CFR 413):** This category consists of electroplating, anodizing, conversion coating, electroless plating, chemical etching and milling, and the manufacturing of printed circuit boards. This category applies to existing job shops only.

**10. Fertilizer Manufacturing (40 CFR 418):** This category applies to discharges from the manufacture of sulfuric acid, nitric acid (in concentrations up to 68%), ammonium sulfate by the synthetic process or by coke oven byproduct recovery, and mixed and blend fertilizers. It is only applicable to sulfuric and nitric acid manufacturing processes that have been constructed or significantly modified since December 7, 1973 and ammonium sulfate and mixed and blend fertilizer manufacturing processes that have been constructed or significantly modified since October 7, 1974.

**11. Glass Manufacturing (40 CFR 426):** This category consists of manufacturers of glass containers, television picture tubes, incandescent lamp envelopes, and hand pressed and blown glass. Only facilities which have been constructed or significantly modified since August 21, 1974 are regulated.

**12. Ink Formulating (40 CFR 447):** This category applies to discharges resulting from the formulation of oil-base ink where the tank washing system uses solvents. It is only applicable to processes that have been constructed or significantly modified since February 26, 1975.

**13. Inorganic Chemicals Manufacturing (40 CFR 415):** This category includes facilities involved in the manufacture of basic inorganic chemicals including alkalis and chlorine, industrial gases, and inorganic pigments.

**14. Iron and Steel (40 CFR 420):** This category covers steel works, blast furnaces (including coke ovens), rolling mills, electrometallurgical products, steel wire drawing and facilities which produce steel nails and spikes, and steel pipes and tubes. This category does not include coil coating operations.

**15. Leather Tanning and Finishing (40 CFR 425):** This category consists of the tanning, currying, and finishing of hides and skins into leather.

**16. Metal Finishing (40 CFR 433):** This category consists of electroplating, anodizing, conversion coating, electroless plating, chemical etching and milling, and the manufacturing of printed circuit boards. This category applies to captive shops (owns 50 percent or more of the surface area finished), and all new source electroplating and metal finishing operations (those which began construction after August 31, 1982).

17. **Metal Molding and Casting (40 CFR 464)**: This category consists of the pouring or injection of molten metal into a mold with the cavity of the mold representing, within close tolerances, the dimensions the final product. This category includes aluminum, copper, ferrous, and zinc casting.

18. **Nonferrous Metals Manufacturing (40 CFR 421)**: This category consists of plants that process nonferrous ore concentrates (primary) and scrap metals (secondary) to recover and increase the metal purity contained in these materials.

19. **Nonferrous Metals Forming (40 CFR 471)**: This category consists of the deformation of a metal (other than iron) or metal alloy (other than iron as the major component by weight) into specific shapes by hot or cold working, drawing, cladding and tube reducing.

20. **Organic Chemicals, Plastics, and Synthetic Fibers (40 CFR 414)**: This category consists of facilities which manufacture organic chemicals, plastics, or synthetic fibers. Companies which simply formulate or package these materials are excluded.

21. **Paint Formulating (40 CFR 446)**: This category applies to discharges resulting from the formulation of oil- base paint where the tank cleaning is performed using solvents. It is only applicable to processes that have been constructed or significantly modified since February 26, 1975.

22. **Paving and Roofing Materials (40 CFR 443)**: This category consists of producers of asphalt paving and roofing emulsions, asphalt concrete, asphalt roofing materials, and linoleum and asphalt felt floor coverings. It is only applicable to facilities that have been constructed or significantly modified since January 10, 1975.

23. **Pesticide Chemicals (40 CFR 455)**: This category includes the manufacturing, formulating, packaging, and repackaging of pesticides.

24. **Petroleum Refining (40 CFR 419)**: This category includes operations which produce gasoline, kerosene, distillate fuel oils, residual fuel oils and lubricants, through fractionation or straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking or other processes.

25. **Pharmaceutical Manufacturing (40 CFR 439)**: This category includes pharmaceutical manufacturing facilities which may use fermentation, extraction, chemical synthesis, mixing/compounding and formulation, or may conduct research.

26. **Porcelain Enameling (40 CFR 466)**: EPA defines porcelain enameling as "that sequence or combination of steps or operations which prepare the metal surface and apply a porcelain or fused silicate coating to the metal basis material."

27. **Pulp, Paper, and Paperboard and the Builders' Paper and Board Mills (40 CFR 430)**: This category includes pulp mills, paper mills, paperboard mills, and building paper and building board mills.

**28. Rubber Manufacturing (40 CFR 428):** This category consists of manufacturers that reclaim rubber or mold, extrude, or fabricate rubber products, including latex products. It is only applicable to facilities that have been constructed or significantly modified since August 23, 1974.

**29. Soap and Detergent Manufacturing (40 CFR 417):** This category consists of facilities which blend or package liquid detergents or manufacture dry detergents by spray drying, drum drying, or dry blending. Only facilities which have been constructed or significantly modified since December 26, 1973 are regulated.

**30. Steam Electric Power Generation (40 CFR 423):** This category is composed of facilities that are engaged in the generation of electricity for distribution and sale, and use either fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle that has a steam/water thermodynamic medium.

**31. Textile Mills (40 CFR 410):** This category applies to the fiber preparation and manufacturing/process of the textile industry.

**32. Timber Products (40 CFR 429):** This category consists of a diverse group of manufacturing plants whose primary raw material is wood and whose products range from finished products to hardboard and preserved wood.

**40 CFR 121-124** – These are the Federal storm water regulations for the permitting of municipalities and industries. Regulation defines storm water terms, permitting, inspection, and sampling requirements.

**40 CFR 136** – These are the regulations for sampling preservation, sample containers, and analytical methods for water, wastewater, and solid waste.

**40 CFR 403** – These are the Federal regulations defining the elements of a pretreatment program, prohibited discharges, and approval process for establishing a pretreatment program.



**City of Phoenix**

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Environmental & Safety Division  
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