



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105

March 26, 2010

In Reply Refer To: WTR-7

Richard Hesler and Maurice Steel, Owners  
Southwest Metal Finishing  
2002 West Campus  
Tempe, Arizona 85282

**Re: September 22, 2009 Clean Water Act Inspection**

Dear Messrs. Hesler and Steel:

Enclosed is the March 26, 2010 report for our September 22, 2009 inspection of Southwest Metal Finishing. Please submit a short response to the findings in Sections 2 through 5, to EPA, Tempe, and ADEQ, by **May 30, 2010**. The main findings are summarized below:

- 1** Southwest Metal Finishing qualifies as a new source metal finisher under 40 CFR 433. The Tempe permit correctly applies the Federal standards and Tempe's local limit.
- 2** On-site treatment is not equivalent to the models used to derive the Federal standards. The resulting inconsistent performance before July 2008 reflects the general unreliability of operator-related source controls. Improved compliance since then demonstrated through sampling reflects new implementation of tank-dedicated ion exchange and compliance testing prior to discharge. The sole use of static rinses, and the specified handling of all spents enhances reliability. Performance would further improve with written SOPs, data logs, hard plumbed delivery, and upgraded treatment equivalent to the models.
- 3** The monitoring by Tempe is representative over the sampling day and the reporting period. Some pollutants could be monitored less frequently because of low levels in the discharge. The pH should be self-monitored by Southwest Metal Finishing daily.

I appreciate your helpfulness extended to me during this inspection. I remain available to the City of Tempe, and to you to assist in any way. Please do not hesitate to call me at (415) 972-3504 or e-mail at [arthur.greg@epa.gov](mailto:arthur.greg@epa.gov).

Sincerely,

*Original signed by:*

Greg V. Arthur  
CWA Compliance Office

Enclosure

cc: Mike Golden, Envr Compliance Supervisor, City of Tempe  
Gregory Frech, WQ Compliance, ADEQ



**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**REGION 9**

**CLEAN WATER ACT COMPLIANCE OFFICE**

**NPDES COMPLIANCE EVALUATION INSPECTION REPORT**

Industrial User: Southwest Metal Finishing  
2002 West Campus, Tempe, Arizona 85282  
New Source Metal Finishing (40 CFR 433)

Treatment Works: City of Phoenix  
91st Avenue Wastewater Treatment Plant  
NPDES Permit No. AZ0020524

Pretreatment Program: City of Tempe

Date of Inspection: September 22, 2009

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Inspection Participants:

US EPA: Greg V. Arthur, Region 9, CWA Compliance Office, (415) 972-3504

Arizona DEQ: None.

City of Tempe: Ernie Frasquillo, Envr Compliance Inspector, (480) 350-2645  
Michael Golden, Envr Compliance Supervisor, (480) 350-2674

Southwest Metal Finishing: Maurice Steel, Owner, (602) 431-9008  
Richard Hesler, Owner, (602) 431-9008  
Matt Sandoval, Maintenance Manager, (602) 431-9008  
Julie Rogers, Rogers Consulting Services, (928) 427-0300  
Chris Marshall, Wastewater, (602) 431-9008

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Report Prepared By: Greg V. Arthur, Environmental Engineer  
March 26, 2010



## 1.0 Scope and Purpose

On September 22, 2009, EPA and the City of Tempe conducted a compliance evaluation inspection of Southwest Metal Finishing, in Tempe, Arizona. The purpose was to ensure compliance with the Federal regulations covering the discharge of non-domestic wastewaters into the sewers. In particular, it was to ensure:

- Classification in the proper Federal categories;
- Application of the correct standards at the correct sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

Southwest Metal Finishing is a significant industrial user (“SIU”) within sewer service areas administered by the City of Tempe whose compliance was assessed as part of an on-going EPA evaluation of industrial users in EPA Region 9 by sector. The inspection participants are listed on the title page. Arthur conducted the inspection.

*See* Appendix 1 on page 15 for a schematic of the layout and configuration of wastewater handling. *Also* see Appendix 2 on page 16 for a process inventory. Photo documentation of this inspection follows in Section 1.7 on pages 5.

## 1.1 Process Description

Southwest Metal Finishing is a full-service job-shop aluminum anodizing facility for medical, aerospace, automotive, and firearms applications. The surface finishing operations involve alkaline cleaning, caustic etching, nitric-acid etching, sulfuric/nitric-acid deoxidation, Type II and III sulfuric-acid anodizing, phosphoric-acid bright dipping, chem-film chromium conversion coating, coloring, and nickel acetate sealing.

Southwest Metal Finishing does not own the parts it finishes. Operations began in 1998. Southwest Metal Finishing discharges non-domestic wastewaters to the Tempe domestic sewers through a single sewer connection under Tempe permit 019901. Domestic sewage discharges through separate connections downstream of the industrial wastewater connection.

## 1.2 Facility SIC Code

Southwest Metal Finishing is assigned the SIC code for plating, polishing, anodizing, and coloring (SIC 3471) and metals coating (SIC 3479).

## 1.3 Facility Wastewater Sources

The anodizing, coating, stripping, and cleaning lines, and the support operations generate spents, rinses, washdowns, bleeds, and residuals. There is one non-domestic connection to the sewers that receives contributions from the industrial wastewater treatment plant



("IWTP") and reject from RO source water demineralization. The 2006 Tempe permit identifies final outfall 5094.01 as the sewer connection to the domestic sewers, and internal outfall 5094.02 as the compliance sample point following treatment at the southwest corner of the process operations. These compliance sampling points are designated in this report as IWD-5094.01 and IWD-5094.02. *See* Photos #1 through #4 in Section 1.7 on page 5.

Spent Solutions – The imparted contamination from the processing of parts and the progressive drop in bath solution strength results in the generation of spents. The generation rates depend on bath usage, effectiveness of bath contamination control, and the amount of drag-out lost into the rinses or to the floor. Anodizing and nickel acetate sealing spents are hauled off-site for disposal as hazardous (T14, T15, T16, T33, T34). Spent acids, caustics, and black dye are delivered by portable pump and hose to on-site batch treatment (T1, T3, T6, T8, T30) for discharge to the sewers through the IWTP. Chem-film, dichromate sealing, deoxidation, and the color dyeing steps are regenerated strictly through additions, and thus do not generate spents (T11, T12, T18, T19-24, T25, T27, T29). Losses from these "adds-only" baths therefore must be through the drag-out of solution into the rinses, since baths without outlets would foul through contamination or fail through use.

Rinses – Ten first-stage static rinses are employed. Up to two rinse tanks per day are drained on a schedule. The static rinses following the acidic and caustic preparation steps, anodizing, and color dyeing are drained once per week to the IWTP by portable pump and hose (T2, T4, T7, T5/10, T17, T26, T28, T36). The static rinses following chem-film, nickel acetate, and dichromate sealing (T13, T31, T36) circulate through dedicated ion exchange, and are drained by portable pump and hose to the IWTP for discharge to the sewers.

Miscellaneous Wastewaters – Fume wet-scrubbing blowdown discharges to the sewers through the pH adjustment treatment step of the IWTP. RO reject discharges to the sewers downstream of the IWTP.

Residuals – The operations generate spent ion exchange canisters for off-site regeneration, and IWTP sludges for off-site disposal as hazardous.

## 1.4 Facility Process Wastewater Handling

Discharge – Process wastewaters from Southwest Metal Finishing drain through a single sewer connection into the Tempe domestic sewers. The Tempe permit identifies the sewer connection as the final sample point, designated in this report after the permit number as IWD-5094.01. The Tempe permit also identifies a sample box following the IWTP as an internal sample point, designated in this report after the permit number as IWD-5094.02. The permit establishes the peak discharge as 302,490 gpd. Effluent metering averaged 3,400 gpd since 2007. *See* Photo #6 in Section 1.7 on page 5.

Composition - The process-related wastewaters listed in section 1.3 above would be expected to contain copper, chromium, nickel, zinc, acidity, surfactants, pollutants cleaned off of parts, and the minerals entrained in the water supply.



Delivery – All rinses and spents are delivered by portable pump and hose directly to treatment or indirectly to treatment through a transfer tank. *See* Photos #1, #2 and #3 in Section 1.7 of this report on page 5.

Treatment – Spent acids, caustics, and black dye are delivered to a 2,000 gallon batch treatment tank for the hydroxide precipitation of metals, ferric sulfate co-precipitation and coagulation, and polymer flocculation, followed by press filtration and testing prior to release. The batch treated spents, all rinses, and the fume scrubber blowdown then proceed through two 3,000 gallon pH adjustment tanks operated separately and in parallel. The tank contents are discharged after testing through the internal sample point IWD-5094.02 to the line leading to the sewer connection IWD-5094.01. Southwest Metal Finishing uses an AA-unit on-site for the testing prior to discharge. RO reject discharges to the line leading to the sewer connection immediately downstream of the internal sample point.

The chromium-bearing and sealing related static rinses circulate through cartridge filters and ion exchange columns installed alongside the rinse tanks. As a result, these static rinses are infrequently drained to the pH adjustment stage of the IWTP for discharge to the sewers. Spent ion exchange columns are hauled for off-site regeneration.

*See* Appendix 1 on page 15 of this report for the configuration and lay-out of the wastewater handling on-site. *Also see* Section 3.2 of this report on page 10, and Photos #4, #5 and #6 in Section 1.7 of this report on page 5.

## **1.5 Sampling Record**

The Tempe permit does not require Southwest Metal Finishing to self-monitor. The City of Tempe collects its own consecutive day sampling biannually for arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, benzene, chloroform, total cyanide, and total toxic organics. Tempe used to collect samples for beryllium, boron, manganese, and molybdenum.

## **1.6 POTW Legal Authorities**

The City of Tempe has enacted an ordinance to implement a pretreatment program within the city limits, with the service area sewered either to Tempe's Kyrene Water Reclamation Plant, or to Phoenix's 91st Avenue Wastewater Treatment Plant. Under this authority, in Chapter 27 of the Tempe City Code, Tempe issued permit No.019901 authorizing the discharge of non-domestic wastewater from Southwest Metal Finishing to the sewers. Southwest Metal Finishing discharges into the city domestic sewers leading to the 91st Avenue Wastewater Treatment Plant and does not contribute to the Kyrene Water Reclamation Plant.





## 1.7 Photo Documentation

The six photographs taken during this inspection are depicted below and saved as *southwestmf-01.jpg through -06.jpg*.

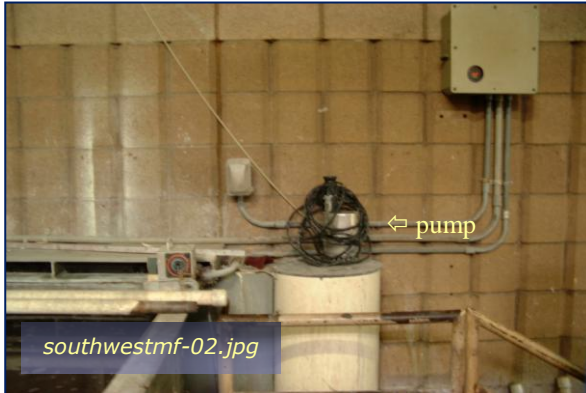


Photo #1: Portable Delivery Pump  
Taken By: Greg V. Arthur  
Date: 09/22/09



Photo #2: Portable Pump Transfer Hose  
Taken By: Greg V. Arthur  
Date: 09/22/09



Photo #3: Transfer Holding Tank T5  
Taken By: Greg V. Arthur  
Date: 09/22/09

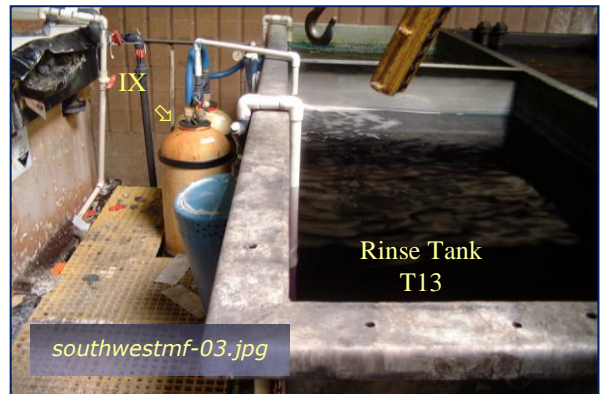


Photo #4: In-Tank Ion Exchange Canisters for T13  
Taken By: Greg V. Arthur  
Date: 09/22/09



Photo #5: IWTP (See Appendix 1 on page 15)  
Taken By: Greg V. Arthur  
Date: 09/22/09



Photo #6: Internal Sample Point IWD-5094.02  
Taken By: Greg V. Arthur  
Date: 09/22/09



## 2.0 Sewer Discharge Standards and Limits

*Federal categorical pretreatment standards (where they exist), national prohibitions, State groundwater, and the local limits (where they exist) must be applied to the sewered discharges from industrial users. (40 CFR 403.5 and 403.6).*

### **Summary**

Southwest Metal Finishing qualifies for regulation under 40 CFR 433 for new source metal finishing. The Tempe permit correctly applied the local limits and Federal standards. The application of Federal standards, national prohibitions, and local limits was determined through visual inspection. *See* Appendix 3 on page 17 of this report for the permit limits.

### **Requirements**

- None.

### **Recommendations**

- Southwest Metal Finishing should determine the percentages of the discharge at the internal outfall IWD-5094.02 that are (1) cyanide-bearing and (2) unregulated dilution waters.
- Southwest Metal Finishing should determine whether a toxic organics management plan could be approved by the City of Tempe for the final discharge outfall IWD-5094.01.

## 2.1 Classification by Federal Point Source Category

Southwest Metal Finishing qualifies as a job-shop metal finisher subject to the Federal metal finishing standards for new sources in 40 CFR 433. The Federal rules in 40 CFR 403.6 define domestic sewage and non-contact waters as dilution waters.

New or Existing Sources – In 40 CFR 403.3(k), a metal finishing process constructed after August 31, 1982 is a new source (1) if it entirely replaces a process which caused a discharge from an existing source or (2) if it is substantially independent of the existing sources on-site. The preamble to the 1988 Federal rule states that the new source standards apply when “an existing source undertakes major construction that legitimately provides it with the opportunity to install the best and most efficient production process and wastewater treatment technologies” (*Fed Register, Vol.53, No.200, October 17, 1988, p.40601*). So after the 1982 deadline, the new source standards apply to the new installation of metal finishing lines, rebuilt or moved lines, lines temporarily removed to install secondary containment, or existing lines converted to do new operations. New source standards generally do not apply to the piecemeal replacement of tanks for maintenance in otherwise intact metal finishing lines.

Southwest Metal Finishing began operations in 1998 after the August 31, 1982 rule promulgation deadline. As a result, Southwest Metal Finishing qualifies as a new source.



## 2.2 Local Limits and National Prohibitions

Local limits and the national prohibitions are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants and their receiving waters from adverse impacts. In particular, they prohibit discharges that can cause the pass-through of pollutants into the receiving waters or into reuse, the operational interference of the sewage treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. The national prohibitions apply nationwide to all non-domestic sewer discharges. The Tempe local limits apply to non-domestic discharges in the Tempe service areas of the Phoenix treatment plant.

## 2.3 Federal Categorical Pretreatment Standards New Source Metal Finishing - 40 CFR 433.17

40 CFR 433.17	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	CNa	TTO
daily-maximum (mg/l)	0.11	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
month-average (mg/l)	0.07	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

Applicability – Under 40 CFR 433.10(a), the metal finishing standards apply to the process wastewaters from the metal finishing lines because the facility’s operations involve electroplating, electroless plating, anodizing, chemical coating, and etching. The metal finishing standards "... apply to plants that perform ..." the core operations of electroplating, electroless plating, etching, anodizing, chemical coating, or printed circuit board manufacturing and they extend to other on-site operations associated with metal finishing and specifically listed in 40 CFR 433.10(a), such as cleaning. If any core operation is performed, the standards apply to discharges from all core and associated operations. As a result, the metal finishing standards apply to all process wastewaters discharged through the internal outfall IWD-5094.02.

Basis of the Standards – The new source metal finishing standards were based on a model pretreatment unit that comprises metals precipitation, settling, sludge removal, source control of toxic organics, no discharge of cadmium-bearing wastewaters, and if necessary, cyanide destruction and chromium reduction. The best-available-technology standards were set where metal finishers with model treatment operated at a long-term average and variability that achieved a compliance rate of 99% (1 in 100 chance of violation).

Compliance Deadline – New sources were required to comply on the first day of discharge.

## 2.4 Combined Federal Standards and Adjustments

The Federal categorical pretreatment standards must be adjusted to account for dilution, if it exists, and for multiple Federal categories, if more than one applies.

Dilution – Under 40 CFR 403.6(d,e), Federal standards must be adjusted using the combined wastestream formula to account for dilution from non-contact cooling waters, water demineralizing, boiler blow down, and domestic sewage. Reverse osmosis reject is a dilution water.





The Federal standards apply without adjustment to the internal outfall IWD-5094.02 upstream of the RO reject. The Federal standards applied to the final outfall IWD-5094.01 would need adjustment for dilution from RO reject and domestic sewage.

Multiple Categories – Not applicable.

Cyanide Standards – Under 40 CFR 433.12(c), the Federal cyanide standards apply only to cyanide-bearing flows, with the standards adjusted for dilution from any non-cyanide bearing wastewaters. The cyanide standards apply by default without adjustment at IWD-5094.02 because there are no identified cyanide sources, although chem-films may contain cyanide.

Toxic Organics Standards – The Federal standards in 40 CFR 433.12(a,b) allow a facility with an approved toxic organics management plan to certify instead of self-monitor. Tempe samples in lieu of self-monitoring twice per year for toxic organics. With an approved toxic organics management plan, Southwest Metal Finishing could certify the non-existence or the physical barrier to discharge over a full or partial list of toxic organics, and thus shorten or eliminate the list of pollutants to be sampled by Tempe in lieu of self-monitoring.

## 2.5 Federal Prohibitions

The Federal standards in 40 CFR 403.6(d) and 403.17(d) prohibit dilution as a substitute for treatment, and the bypassing of any treatment necessary to comply with standards. The Tempe permit establishes the prohibition against the dilution as a substitute for treatment (Part 5§A-8), and against bypassing treatment necessary to comply (Part 5§B-3).

## 2.6 Compliance Sampling and Point(s) of Compliance

The permit identifies two compliance sampling points: the final outfall IWD-5094.01 and the internal outfall IWD-5094.02. *See* Section 1.4 of this report on page 3.

Federal Standards - Federal categorical pretreatment standards apply end-of-process-after-treatment to all Federally-regulated discharges to the sewers. The final and internal outfalls are both suitable end-of-process-after-treatment sample points representative of the day-to-day discharge of Federally-regulated wastewaters from Southwest Metal Finishing. They are also suitable end-of-process-after-treatment sample points representative of the day-to-day discharge of cyanide-bearing wastewaters as long as there are no cyanide sources.

Local Limits - Local limits and the national prohibitions apply end-of-pipe to non-domestic flows. The final outfall is a suitable end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges from Southwest Metal Finishing.

Protocols – Local limits and national prohibitions are instantaneous-maximums comparable to samples of any length. Federal standards are daily-maximums comparable to 24-hour composites, which can be replaced with grabs or manually-composited grabs representative of the sampling day's discharge. *See* Section 5.0 on page 14 and Appendix 3 on page 17.



### 3.0 Compliance with Federal Categorical Standards

*Industrial users must comply with the Federal categorical pretreatment standards that apply to their process wastewater discharges. 40 CFR 403.6(b).*

*Categorical industrial users must comply with the prohibition against dilution of the Federally-regulated waste streams as a substitute for treatment. 40 CFR 403.6(d).*

*Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).*

To achieve compliance, Southwest Metal Finishing relies on source controls instead of treatment equivalent to the models used in originally setting the Federal standards. Inconsistent performance prior to July 2008 reflects the unreliability of operator-related source controls the success of which depend on minimizing operator error. Since then, Southwest Metal Finishing has demonstrated consistent compliance through the installation of built-in ion exchange and bag filtration for three static rinses, on-site atomic adsorption testing prior to discharge, and built-in excess holding capacity. In addition, performance is improved through the sole use of static rinses drained on a schedule, batch treatment of selected spent solutions, segregated hauling of some spents for off-site disposal, and effective secondary containment. Performance would further improve through written SOPs, data logs, and hard plumbed wastewater delivery to the IWTP. *See* Section 2.0 on page 6 of this report. *Also* see Appendices 4 and 5 on pages 18 and 19 of this report for a summary of the compliance sampling and the resulting list of violations.

#### ***Requirements***

- None.

#### ***Recommendations***

- Hard-piping and permanent standpipe stations should be established for the delivery of spent baths and rinses to treatment in order to eliminate the use of long flexible hosing.
- Wastewater handling procedures should be codified into **written** standard operating procedures (“SOPs”) for delivery, treatment, and testing.
- Implementation of the wastewater handling SOPs should be verified through the maintenance of daily logs kept by the operators and compiled for review by management.

### 3.1 Sampling Results

The three-year sample record consists of semiannual multi-day sampling collected by Tempe. All samples collected through IWD-5094.01 and IWD-5094.02 were 24-hour composites. The samples for cyanide and toxic organics were grab samples.



### 3.2 Best-Available-Technology Treatment

Process-related wastewaters generated by Southwest Metal Finishing, an average of 3,400 gpd, discharge from an industrial wastewater treatment plant to the sewers. The IWTP is not equivalent in design to the best-available-technology (“BAT”) model treatment for metal finishing. The rinses do not undergo model metals precipitation and settling. Second, spents are treated through metals precipitation but the solids removal step is through filter pressing which is less efficient than the model chemical-aided settling. As a result, the sampling results inconsistently complied with Federal standards, with average and calculated 99th% peak concentrations of 0.004 and 0.014 mg/l cadmium, 2.443 and 10.77 mg/l chromium, 2.081 and 17.39 mg/l copper, <0.100 mg/l lead, 1.223 and 3.531 mg/l nickel, <0.010 mg/l silver, and 0.889 and 2.936 mg/l zinc at IWD-5094.02, and <0.010 mg/l total cyanide, and 0.020 and 0.062 mg/l total toxic organics at IWD-5094.01.

Over the past three years beginning in 2007, sampling established 24 instances of violation of the Federal standards for chromium, copper, nickel, and zinc. However, the last violations were in June 2008. Since then, all samples were in consistent compliance with all Federal daily-maximum standards, resulting in lower average and 99th% peak concentrations of 0.793 and 1.469 mg/l chromium, 0.771 and 2.057 mg/l copper, 0.938 and 2.271 mg/l nickel, and 0.671 and 2.009 mg/l zinc at IWD-5094.02. The recent samples also resulted in consistent compliance with all Federal monthly-average standards, resulting in lower monthly-average and 99th% peak monthly-average concentrations of 0.791 and 0.966 mg/l chromium, 0.668 and 1.702 mg/l copper, 0.899 and 1.947 mg/l nickel, and 0.686 and 1.538 mg/l zinc. These later sampling results indicate that the statistical probabilities of violating any of the Federal standards are essentially 0% for any sampling day and 1-2% for any sampling month.

The performance improved through the implementation of built-in source controls and procedures for testing prior to discharge. A few efficiencies (+) and deficiencies (-) in the design and operation were observed during this inspection, and are listed below.

- + On-site atomic adsorption testing prior to discharge from batch treatment.
- + Sole use of static rinses drained on a schedule – good delivery control to treatment.
- + Batch treatment of spents involving metals co-precipitation, coagulation, flocculation.
- + Separate handling for off-site disposal of anodizing and nickel acetate sealing spents.
- + Comprehensive secondary containment.
- + Ion exchange and bag filtration of the principle metals-bearing static rinses.
- Rinses discharge untreated for metals.
- Batch treatment for spents involves less than efficient filter press removal of solids.
- Unwritten wastewater handling procedures – SOP implementation is not logged.
- Spent solutions are delivered by portable pump and hosing to treatment.

### 3.3 Dilution as a Substitute for Treatment

The Federal standards in 40 CFR 403.6(d) prohibit "dilution as a substitute for treatment" in order to prevent compromising BAT model treatment with dilute waste streams. In particu-



lar, this prohibition applies when the sample results for a diluted waste stream are below the Federal standards and the apparent compliance is used to justify discharge without treatment. There are two conditions that need to be established in order to make a determination of non-compliance with this prohibition. First, some or all of the Federally-regulated wastewaters must discharge without undergoing BAT model treatment or its equivalent. Second, there must be some form of excess water usage within a Federally-regulated process.

There is no evidence of “dilution as a substitute for treatment” since Southwest Metal Finishing does not meet both conditions of non-compliance with certainty. The first condition is met since all Federally-regulated waters discharge through less than BAT model treatment. However, the second condition is not met since all rinses and delivered spents are operated as static and on-demand.

### **3.4 Bypass Provision**

The Federal standards in 40 CFR 403.17 prohibit the bypassing of any on-site treatment necessary to comply with standards unless the bypass was unavoidable to prevent the loss of life, injury, or property damage, and there were no feasible alternatives. This provision explicitly prohibits bypasses that are the result of a short-sighted lack of back-up equipment for normal downtimes or preventive maintenance. It also explicitly prohibits bypasses that could be prevented through wastewater retention or the procurement of auxiliary equipment. It specifically allows bypasses that do not result in violations of the standards as long as there is prior notice and approval from the sewerage agency or State.

There were no observed methods of bypassing at Southwest Metal Finishing. However, the delivery of spent baths and static rinses involves portable pumps and long flexible hosing which makes an inadvertent bypassing of treatment possible. *See* Photos #1 and #2 in Section 1.7 on page 5.



#### 4.0 Compliance with Local Limits and National Prohibitions

*All non-domestic wastewater discharges to the sewers must comply with local limits and the national prohibitions. 40 CFR 403.5(a,b,d).*

*Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).*

The sample record indicates that Southwest Metal Finishing now consistently complies with its local limits for metals, cyanide, organics, and pH. *See* Appendices 4 and 5 on pages 18 and 19 of this report for a summary of the compliance sampling and the resulting list of local limit violations. *Also* see Sections 3.0 and 5.0 on pages 9 and 14 of this report.

##### ***Requirements***

- None.

##### ***Recommendations***

- None.

#### 4.1 National Objectives

The general pretreatment regulations were promulgated in order to fulfill the national objectives to prevent the introduction of pollutants that:

- (1) cause operational interference with sewage treatment or sludge disposal,
- (2) pass-through sewage treatment into the receiving waters or sludge,
- (3) are in any way incompatible with the sewerage works, or
- (4) do not improve the opportunities to recycle municipal wastewaters and sludge.

This inspection did not include an evaluation of whether achievement of the national objectives in 40 CFR 403.2 have been demonstrated by the Phoenix 91st Avenue wastewater treatment plant through consistent compliance with its own sludge and discharge limits.

#### 4.2 Local Limits for Oxygen Demanding Pollutants and The National Prohibition Against Interference

High-Strength Organics - The process-related wastewaters discharged to the sewers are not expected to be high enough in organics strength to pose a risk of interference, with the organics strength significantly less than domestic sewage.

Metals and Cyanide – For IWD-5094.01, there were no violations of the local limits for arsenic, cadmium, lead, selenium, silver, zinc, mercury, or cyanide. The only local limit violations were for copper in June 2008. Since then, the water quality has improved and





future violations of the local limits are not expected. As a result, there is no evidence that these discharges resulted or will result in the operational interference of the Tempe and Phoenix collection systems and Phoenix wastewater treatment plant.

#### **4.3 Local Limits for Toxic Metals, Cyanide, and Other Pollutants and The National Prohibition Against Pass-Through**

Metals and Cyanide – For IWD-5094.01, there were no violations of the local limits for arsenic, cadmium, lead, selenium, silver, zinc, mercury, or cyanide. The only local limit violations were for copper in June 2008. Since then, the water quality has improved and future violations of the local limits are not expected. As a result, there is no evidence that these discharges resulted or will result in a pass-through of pollutants from the Phoenix wastewater treatment plants to the receiving waters.

Toxic Organics – For IWD-5094.01, there were no violations of the local limits for benzene, chloroform, pesticides, and PCBs.

Oil and Grease – There are no local limits for oil and grease.

#### **4.4 Local Limits for pH and Sulfides, and The National Prohibitions Against Safety Hazards and Corrosive Structural Damage**

Corrosion - Sewer collection system interferences related to the formation of hydrogen sulfide and the resulting acidic disintegration of the sewers are possible but not expected. The wastewaters discharged to the sewers are not high-strength in biodegradable organics. The discharge through IWD-5094.01 is controlled for pH through pH adjustment steps. For this reason, the final discharge through IWD-5094.01 needs daily discharge self-monitoring for pH.

Flammability - Flammability would not be expected because sampling shows that the discharges to the sewer entrain negligible amounts of volatile organics.



## 5.0 Compliance with Federal Monitoring Requirements

*Significant industrial users must self-monitor for all regulated parameters at least twice per year unless the sewerage agency monitors in place of self-monitoring. 40 CFR 403.12(e) & 403.12(g).*

*Each sample must be representative of the sampling day's operations. Sampling must be representative of the conditions occurring during the reporting period. 40 CFR 403.12(g) and 403.12(h).*

Permit Requirements – Southwest Metal Finishing is not required to self-monitor. Instead in lieu of self-monitoring, the City of Tempe collects all samples to determine compliance with the Federal standards and local limits, and does so semiannually on consecutive multiple days. Over the most recent three year period, the sample records for the final and internal outfalls, IWD-5094.01 and IWD-5094.02, show that the City of Tempe (1) collected all samples from the designated compliance sampling points, (2) correctly obtained 24-hour composites for metals and grabs for the other pollutants, and (3) followed appropriate chain-of-custody procedures.

Representativeness – The sample records for IWD-5094.01 and IWD-5094.02 appear to be representative of the discharges to the sewers over the sampling day and the six-month reporting period. At IWD-5094.02 some pollutants present at concentrations well below the Federal standards can be monitored less frequently even down to the Federal minimum level (*cadmium, lead, silver*). Compliance with the Federal cyanide standards would be better determined through cyanide sampling at IWD-5094.02. The method detection limits always must be less than the Federal standards and local limits (*arsenic, cadmium lead, selenium at IWD-5094.01 and silver at IWD-5094.02*). Toxic organics monitoring could be conducted solely at IWD-5094.01 as long as the Federal toxic organic standards are adjusted to account for dilution. This would allow the same samples to be used to determine compliance with both the Federal toxic organics standards and the local limits for benzene, chloroform, and pesticides.

### ***Requirements***

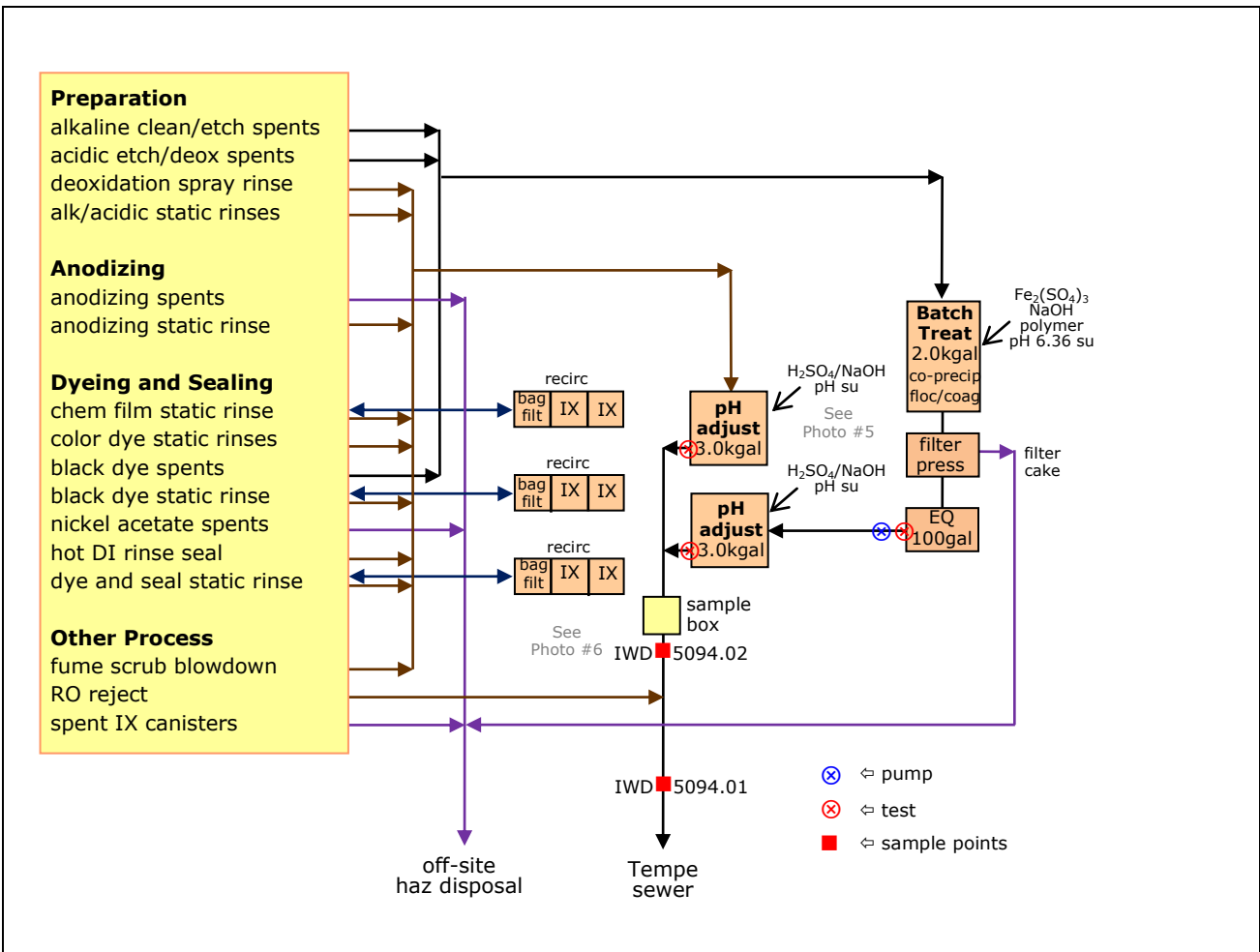
- *See* Appendix 3 on page 17 of this report for the self-monitoring and city monitoring requirements that would be considered to be representative of the discharges.

### ***Recommendations***

- Any self-certification statements should include copies of the hazardous waste manifests documenting the off-hauling of spents, and residuals.
- *See* Sections 4.0 and 4.4 on pages 12 and 13 of this report for findings regarding self-monitoring for pH.



**Appendix 1**  
**Southwest Metal Finishing - Configuration and Layout**





**Appendix 2**  
**Southwest Metal Finishing - Tank Inventory, Tank Number, and Delivery Method**

Delivery	Tank Volume (gal) and Contents			Delivery	Tank Volume (gal) and Contents		
BATCH-26	T1	1900	alkaline cleaning	ADDS	T20	50	colored dye
IWTP-1	T2	1500	1° static for T1	ADDS	T21	50	colored dye
BATCH-52	T3	2500	caustic etching	ADDS	T22	50	colored dye
IWTP-1	T4	3000	1° static for T3	ADDS	T23	50	colored dye
IWTP-1	T5	3000	holding and transfer tank	ADDS	T24	50	colored dye
BATCH-4	T6	500	nitric-acid etching	ADDS	T25	500	colored dye
IWTP-1	T7	3000	1° static for T6	IWTP-1	T26	500	1° static for dyes
BATCH-1	T8	500	phosphoric-acid bright dip	ADDS	T27	500	colored dye
BATCH-1	T9	3000	sulfuric/nitric-acid deox	IWTP-1	T28	500	1° static for dyes
IWTP-1	T10	-	spray rinse pumped to T5	ADDS	T29	500	colored dye
ADDS	T11	3000	◇◆ gold chem film	BATCH-1	T30	300	black dye
ADDS	T12	1200	◇◆ clear chem film	IX-IWTP	T31	3000	1° static for T30
IX-IWTP	T13	1800	◇◆ 1° static for chem film	ADD	T32	1000	red color dye
HAZ-26	T14	1900	Type II anodizing	HAZ-8	T33	500	nickel acetate seal
HAZ-26	T15	1900	Type III anodizing	HAZ-8	T34	1500	nickel acetate seal
HAZ-26	T16	2800	Type II anodizing	ADD	T35	500	blue color dye
IWTP-½	T17	?	1° static for T14-T16	IX-IWTP	T36	2000	1° static for T32-T35
ADDS	T18	50	◇◆ chem film	IWTP-1	T37	2000	DI hot rinse seal
ADDS	T19	50	colored dye	ADDS	T38	100	◆ dichromate seal

◇ possible cyanide-bearing wastewaters	ADDS	Additions only
◆ chromium-bearing wastewaters	BATCH-52	Pump to batch treat (1/year)
	BATCH-26	Pump to batch treat (1/6-months)
	BATCH-4	Pump to batch treat (1/month)
	BATCH-1	Pump to batch treat (1/week)
	HAZ-26	Off-site haz disposal (1/6-months)
	IWTP-1	Pump to pH adjust tanks (1/week)
	IWTP-½	Pump to pH adjust tanks (2/week)
	IX-IWTP	Ion exchange recirculation



**Appendix 3**  
**Sewer Discharge Standards and Limits for Southwest Metal Finishing**

Pollutants Of Concern	Fed stds (d-max)	Fed stds (mo-avg)	nat'l pro (instant)	local limits (inst/dmax)	monitoring frequency ①	
					discharger	city
<b>Final Outfall @ IWD-5094.01</b>						
arsenic (mg/l)	-	-	-	0.13	③	3/six-mos
cadmium (mg/l)	②	②	-	0.047	③	3/six-mos
copper (mg/l)	②	②	-	1.5	③	3/six-mos
lead (mg/l)	②	②	-	0.41	③	3/six-mos
mercury (mg/l)	-	-	-	0.0023	③	3/six-mos
selenium (mg/l)	-	-	-	0.10	③	3/six-mos
silver (mg/l)	②	②	-	1.2	③	3/six-mos
zinc (mg/l)	②	②	-	3.5	③	3/six-mos
total cyanide (mg/l)	②	②	-	2.0	③	<b>1/year</b>
toxic organics (mg/l) ⑦	②	-	-	-	④	④
benzene (mg/l)	-	-	-	0.035	③	1/six-mos
chloroform (mg/l)	-	-	-	2.0	③	1/six-mos
pesticides and PCBs	-	-	-	⑥	③	1/six-mos
COD (mg/l)	-	-	-	-	③	3/six-mos
BOD (mg/l)	-	-	-	-	③	③
TSS (mg/l)	-	-	-	-	③	1/six-mos
TDS (mg/l)	-	-	-	-	③	1/six-mos
fluoride (mg/l)	-	-	-	-	③	③
flow (gpd)	-	-	-	302,490	<b>daily</b>	n/a
pH (s.u.)	-	-	<5.0	5.0-10.5	<b>daily</b>	3/six-mos
explosivity	-	-	<140°F ⑤	<10% LEL	③	③

<b>Internal Outfall @ IWD-5094.02</b>						
cadmium (mg/l)	0.11	0.07	-	-	③	<b>2/year</b>
chromium (mg/l)	2.77	1.71	-	-	③	3/six-mos
copper (mg/l)	3.38	2.07	-	-	③	3/six-mos
lead (mg/l)	0.69	0.43	-	-	③	<b>2/year</b>
nickel (mg/l)	3.98	2.38	-	-	③	3/six-mos
silver (mg/l)	0.43	0.24	-	-	③	<b>2/year</b>
zinc (mg/l)	2.61	1.48	-	-	③	3/six-mos
total cyanide (mg/l)	1.20	0.65	-	-	③	<b>2/year</b>
toxic organics (mg/l) ⑦	2.13 ②	-	-	-	④	<b>2/year</b> ④

- ① Recommended **reductions in green**. Recommended **increases in red**.
- ② Federal standards apply can also apply at IWD-5094.01 with an adjustment to account for dilution.
- ③ As part of periodic priority pollutant scans in order to identify changes in discharge quality.
- ④ Self-certification to following an approved toxic organics management plan is allowed in lieu of self-monitoring. A City inspection could then qualify as an independent determination.
- ⑤ Closed-cup flashpoint.
- ⑥ City ordinance prohibits the introduction of these pollutants in any amount.
- ⑦ Total toxic organics defined as the concentration sum for all pollutants listed in 40 CFR 433.11(e).





**Appendix 4**  
**Wastewater Discharge Quality for Southwest Metal Finishing**

Sample Record Summary for IWD-5094.01 (01/01/07-09/30/09)								
pollutants (µg/l)	effluent sampling results				violation rate ①			sample count
	mean	99th%	min	max	d-max	mo-av	instant	
arsenic	<50	<50	<50	<250	-	-	0/15③	17
beryllium	<1	<1	<1	<10	-	-	-	6
boron	905.6	3123.5	<50	2800	-	-	-	8
cadmium	1.2	7.3	<5	11	④	④	0/16③	17
chromium	2970.3	9024.6	<50	5800	④	④	-	6
copper	1555.4	12724.	<50	20000	④	④	2/17	17
lead	<100	<100	<100	<1000	④	④	0/15③	17
mercury	<0.2	<0.2	<0.2	<0.2	-	-	0/17	17
manganese	173.8	692.5	<20	490	-	-	-	6
molybdenum	<50	<50	<50	<250	-	-	-	6
nickel	1250.3	6473.8	<50	5800	④	④	-	6
selenium	<20	<20	<20	<200	-	-	0/16③	17
silver	<10	<10	<10	<100	④	④	0/17	17
zinc	471.4	1863.6	<50	2000	④	④	0/17	17
total cyanide	<10	<10	<10	<10	④	④	0/10	10
total toxic organics ②	20.3	62.0	3.3	63.9	④	-	0/13	13
BOD (mg/l)	102	312	26	316	-	-	0/10	10
TSS (mg/l)	732	2596	70	2600	-	-	0/14	14
TDS (mg/l)	1555	4132	840	4500	-	-	0/14	14
fluoride (mg/l)	12.9	44.2	0.9	47	-	-	-	10
flow (gpd)	3387	10277	1494	15414	-	-	0/22	22
pH (s.u.)	6.80 min – 7.91 median – 10.8 max				-	-	0/17	17

Sample Record Summary for IWD-5094.02 (01/01/07-09/30/09)								
pollutants (µg/l)	effluent sampling results				violation rate ①			sample count
	mean	99th%	min	max	d-max	mo-av	instant	
cadmium	4.0	13.8	<1	21.0	0/28	0/10	-	28
chromium	2442.8	10765.	65	12500	6/32	2/12	-	32
copper	2080.8	17393.	25	36000	2/29	1/10	-	29
lead	<100	<100	<100	<100	0/28	0/10	-	28
nickel	1223.7	3531.3	30	4800	2/32	2/12	-	32
silver	<10	<10	<10	<500	0/27③	0/10	-	28
zinc	889.1	2935.6	<50	3300	2/29	2/10	-	29
total cyanide	74	-	74	74	0/1	0/1	-	1
total toxic organics	7.4	15.3	7.2	12.2	0/4	-	-	4

- ① Monthly averages calculated by calendar month of both self-monitoring and Tempe samples.
- ② TTO sampling covers benzene, chloroform, pesticides, PCBs - no violations recorded.
- ③ Not all samples were suitable to determine compliance because the analytical detection limits exceeded the standards or limits.
- ④ Fed std apply at IWD-5094.02 but can apply at IWD-5094.01 with adjustment to account for dilution.



**Appendix 5**  
**Violation Summary for Southwest Metal Finishing**

Federal Standard Violations (01/01/07-09/30/09)							
sample dates	type	Sampler	point	Fed standards / local limits ①		viols	days
06/25/08	24-h	POTW	5094.02	chromium – Fed d-max	2.77 mg/l	5.10	1
Jun 2008	24-h	POTW	5094.02	chromium – Fed mo-av	1.71 mg/l	3.60	30
06/25/08	24-h	POTW	5094.02	copper – Fed d-max	3.38 mg/l	36.0	1
06/25/08 ④	24-h	POTW	5094.01	copper – Fed d-max	3.38 mg/l	20.0	*
06/24/08	24-h	POTW	5094.02	copper – Fed d-max	3.38 mg/l	3.80	1
Jun 2008	24-h	POTW	5094.02	copper – Fed mo-av	2.07 mg/l	19.9	30
06/25/08	24-h	POTW	5094.02	nickel – Fed d-max	3.98 mg/l	4.00	1
Jun 2008	24-h	POTW	5094.02	nickel – Fed mo-av	2.38 mg/l	2.90	30
06/25/08	24-h	POTW	5094.02	zinc – Fed d-max	2.61 mg/l	3.30	1
Jun 2008	24-h	POTW	5094.02	zinc – Fed mo-av	1.48 mg/l	2.55	30
Mar 2008	24-h	POTW+IU ③	5094.02	zinc – Fed mo-av	1.48 mg/l	2.55	30
11/07/07	24-h	POTW	5094.02	chromium – Fed d-max	2.77 mg/l	3.00	1
11/07/07 ④	24-h	POTW	5094.01	chromium – Fed d-max	2.77 mg/l	4.50	*
11/07/07	24-h	POTW	5094.02	nickel – Fed d-max	3.98 mg/l	4.80	1
11/07/07 ④	24-h	POTW	5094.01	nickel – Fed d-max	3.98 mg/l	5.80	*
Nov 2007	24-h	POTW	5094.02	nickel – Fed mo-av	2.38 mg/l	2.43	30
03/09/07	24-h	POTW+IU ③	5094.02	chromium – Fed d-max	2.77 mg/l	9.65	1
03/08/07	24-h	POTW+IU ③	5094.02	chromium – Fed d-max	2.77 mg/l	11.5	1
03/08/07 ④	24-h	POTW	5094.01	chromium – Fed d-max	2.77 mg/l	5.40	*
03/07/07	24-h	POTW+IU ③	5094.02	chromium – Fed d-max	2.77 mg/l	5.40	1
03/06/07	24-h	POTW+IU ③	5094.02	chromium – Fed d-max	2.77 mg/l	12.5	1
03/06/07 ④	24-h	POTW	5094.01	chromium – Fed d-max	2.77 mg/l	5.80	*
Mar 2007	24-h	POTW+IU ③	5094.02	chromium – Fed mo-av	1.71 mg/l	9.76	31
03/06/07	24-h	POTW	5094.02	zinc – Fed d-max	2.61 mg/l	3.20	1
Local Limit Violations (01/01/07-09/30/09)							
06/25/08	24-h	POTW	5094.01	copper – local instant	1.50 mg/l	20.0	1
06/24/08	24-h	POTW	5094.01	copper – local instant	1.50 mg/l	2.60	1
<b>total days of violation</b>							<b>225</b>

Statistical Violation Probabilities (07/01/08-09/30/09)				
violation probability ①	mean (µg/l)	std dev (µg/l)	statistical probability	Percent
Fed – chromium (d-max)	µ = 793.6	σ = 289.8	α(2770) = 0.0000	~0%
Fed – copper (d-max)	µ = 771.4	σ = 551.7	α(3380) = 0.0000	~0%
Fed – copper (mo-avg)	µ = 668.3	σ = 443.4	α(2070) = 0.0008	~0%
Fed – nickel (d-max)	µ = 937.9	σ = 592.0	α(3980) = 0.0000	~0%
Fed – zinc (d-max)	µ = 670.7	σ = 574.2	α(2610) = 0.0000	~0%
Fed – zinc (mo-avg)	µ = 686.0	σ = 365.8	α(1480) = 0.0150	<b>1-2%</b>

- ① Monthly averages calculated by calendar month of both self-monitoring and Tempe samples.
- ② TTO sampling covers benzene, chloroform, pesticides, PCBs - no violations recorded.
- ③ Tempe and Southwest split sample results are averaged by sampling day.
- ④ Sample violations for Federal standards applied without adjustment to IWD-5094.01. Days of violation does not double count the same standard at both points on the same day (\*).