



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

January 22, 2010

In Reply Refer To: WTR-7

Rick Clark, Operations Manager  
Metco Metal Finishing  
3508 East Corona Avenue  
Phoenix, Arizona 85040

**Re: September 23, 2009 Clean Water Act Inspection**

Dear Mr. Clark:

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

- 1** Metco Metal Finishing qualifies as a new source metal finisher under 40 CFR 433.
- 2** On-site treatment is equivalent to the models used in setting the Federal standards. Major operational controls which improve performance are also employed, most notably redundant treatment steps, segregated collection and handling, and reaction end-point metering for treatment process controls. The chromium reduction and metals precipitation steps could be better optimized. There was a three-day period of treatment failure in September 2008. Otherwise, the sampling has demonstrated consistent compliance with Federal standards and local limits.
- 3** The self-monitoring is representative over the sampling day and the reporting period.
- 4** The hard-piped delivery of spents would eliminate the potential to bypass treatment posed by the use of portable pumps and flexible hosing.

I appreciate your helpfulness extended to me during this inspection. I remain available to the City of Phoenix, 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: Pete Espericueta, Senior WQ Inspector, City of Phoenix  
Moses Olade, Environmental Hydrologist, ADEQ



**U.S. ENVIRONMENTAL PROTECTION AGENCY**  
**REGION 9**  
**CLEAN WATER ACT COMPLIANCE OFFICE**

**NPDES COMPLIANCE EVALUATION INSPECTION REPORT**

Industrial User: Metco Metal Finishing  
3508 East Corona Avuene, Phoenix, Arizona 85040  
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 Phoenix

Date of Inspection: September 23, 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 Phoenix: Pete Espericueta, Senior WQ Inspector, (602) 276-2915

Metco Metal Finishing: Rick Clark, Operations Manager, (602) 276-4120  
Julie Rogers, Rogers Consulting Services, (520) 490-8380  
Christina Munry, Office Manager, (602) 276-4120

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Report Prepared By: Greg V. Arthur, Environmental Engineer  
January 22, 2010



## 1.0 Scope and Purpose

On September 23, 2009, EPA and the City of Phoenix conducted a compliance evaluation inspection of Metco Metal Finishing in Phoenix, 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.

Metco Metal Finishing is a significant industrial user (“SIU”) within sewer service areas administered by the City of Phoenix 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 16 for a schematic of the layout and configuration of wastewater handling. *Also* see Appendix 2 on pages 17 through 18 for a process inventory. Photo documentation of this inspection follows in Section 1.7 on pages 6 and 7.

## 1.1 Process Description

Metco Metal Finishing is a job-shop metal finisher, primarily of steel and aluminum parts, for military, medical, and some automotive applications. The primary metal finishing operations involve alkaline zinc plating, Type II sulfuric-acid anodizing, chem-film chromium conversion coating, and nickel plating. Metco Metal Finishing operations consist of two sites, the older site that began operations in 1996, and the newer site that began operations in 2006. The operations by processing line follow below.

- Bright Nickel Line – alkaline cleaning, alkaline electrocleaning, hydrochloric-acid pickling, phosphoric-acid bright dipping, cyanide-copper plating, acid-tin plating, sulfuric-acid deactivation, bright nickel plating, trivalent-chrome plating.
- Electroless Nickel Line – alkaline soap cleaning, alkaline electrocleaning, hydrochloric-acid pickling, electroless-nickel plating, acid-nickel strike, nitric-acid passivation, nitric-acid desmut, phosphoric-acid bright dipping, zincate coating, ammonium-hydroxide strip, bisulfate zincate strip, nitric-acid rack strip.
- Zinc Barrel Line – alkaline soak cleaning, alkaline electrocleaning, hydrochloric-acid descale, zinc phosphating, alkaline-zinc plating, chromate conversion coating (clear, yellow iridite), Teflon coating.
- Zinc Hand Line – alkaline soak cleaning, alkaline electrocleaning, hydrochloric-acid pickling, alkaline-zinc plating, zinc phosphating, chromate conversion coating (black, clear, olive drab), zinc regeneration tank.



- New Anodizing Line – alkaline cleaning, phosphoric-acid microetching, caustic etching, nitric-acid desmut, Type II sulfuric-acid anodizing, dye (black, red, gold, blue) chromate conversion coating (clear, yellow), nickel acetate seal.
- New Zinc Line – alkaline cleaning, alkaline electrocleaning, caustic predip, hydrochloric-acid pickling, alkaline-zinc plating, chromate conversion coating (clear, yellow, black), chromic/sulfuric-acid post dip.

Metco Metal Finishing does not own the parts it finishes. Operations began in 1996 and were expanded in 2006. Metco Metal Finishing discharges non-domestic wastewaters to the Phoenix domestic sewers primarily through a single sewer connection. Domestic sewage discharges through separate connections downstream of the industrial wastewater connection.

## 1.2 Facility SIC Code

Metco 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 plating, anodizing, coating, phosphating, stripping, and cleaning lines, and the support operations generate spents, rinses, washdowns, bleeds, and residuals. There is one main non-domestic connection to the sewers that receives contributions from the industrial wastewater treatment plant (“IWTP”) as its principle source. The 2009 Phoenix permit identifies the main sewer connection, designated as the sample point in this report as IWD-2950.01.

Spent Solutions – The imparted contamination from the processing of parts and the progressive drop in 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. Most spents are handled on-site through portable pump and hose delivery to holding for metered feed through treatment. Nickel-bearing spents are toled to batch treatment. Cyanide-bearing spents are hauled off-site for disposal. A few plating and chromate solutions are regenerated strictly through additions and thus do not generate spents. Losses from these "adds-only" baths must be through the drag-out of solution into the rinses, since baths without outlets would foul through contamination or fail through use.

Rinses – Most solution steps employ first-and second-stage on-demand cascade rinses. Each of the lines ends with final DI overflow rinses. A few solution steps involve first-stage drag-out rinses which are reclaimed as solution make-up. The rinses following cyanide-copper plating are all drag-outs, thereby capturing nearly all cyanide-bearing wastewaters.

Miscellaneous Wastewaters – Additional wastewaters also discharge downstream of treatment and IWD-2950.01. Among these additional wastewaters are air conditioner bleed, and domestic sink drainage. *See Photo #9* in Section 1.7 of this report on page 6.



Residuals – The operations generate spent in-line filters for the nickel, electroless nickel, and alkaline-zinc plating steps, and IWTP sludges for off-site disposal as hazardous.

## 1.4 Facility Process Wastewater Handling

Discharge – All process wastewaters from Metco Metal Finishing appear to drain through a single sewer connection into the Phoenix domestic sewers. A final weir box near the exit in the south plating area is identified in the permit as the final compliance sample point, designated in this report after the permit number as IWD-2950.01. The permit establishes the average discharge as 25,000 gpd. Effluent metering averaged 27,000 gpd since 2007.

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

Delivery – Rinses are hard-plumbed through intermediate lift station sumps to the IWTP. Spents are delivered to the IWTP by portable pump and hose, or by tote in the case of nickel, with spents collected before the first shift in the morning. There are six lift station sumps for the capture and delivery of the wastewaters. These lift stations are designated as Weir Boxes A, B, C, D, and E, the New Site Transfer Station. *See* Photos #1 and #6 in Section 1.7 of this report on pages 5 and 6.

Treatment – Spent solutions are delivered by portable pump and hose to three 3,000 gallon holding tanks and one nickel batch treatment tank segregated to handle (1) acids, (2) alkalines including alkaline-zinc plating spents, (3) chromium-bearing, and (4) nickel-bearing. The rinses from the six lift stations feed into a fourth 3,000 gallon holding tank. The contents in the three holding tanks for spents are metered into treatment at a rate of ~10 gallons per hour. Rinses delivered into the fourth holding tank are fed into treatment at a rate of ~30 gallons per minute. Treatment involves nominal chromium reduction, dual-stage metals hydroxide precipitation, followed by chemically-unaided solids settling and final ultra-filtration. The ultra-filtration permeate is further treated through final pH adjustment, collected into a final storage tank, and pump discharged through the final weir box to the sewer.

Settled metals precipitate solids and the batch treated nickel plating spents are dewatered through sludge decanting and filter pressing. The press filtrate returns to the solids settling tank, along with sludge holding decant, and ultra-filtration reject.

*See* Sections 3.2 of this report on page 10, and Photos #7 to #9 in Section 1.7 of this report on pages 6.

## 1.5 Sampling Record

Metco Metal Finishing self-monitors from biweekly to semiannually depending on parameter as required by the City of Phoenix permit. Phoenix also collects its own samples bimonthly.



## 1.6 POTW Legal Authorities

The City of Phoenix has enacted an ordinance to implement a pretreatment program in the areas serviced by the 91st and 23rd Avenue Wastewater Treatment Plants. Under this authority, the City issued City permit No.2950 authorizing discharge of non-domestic wastewater from Metco Metal Finishing to the sewers.

## 1.7 Photo Documentation

Nine of the 12 photographs taken during this inspection are depicted below and saved as *metco-02.jpg through -12.jpg*. One photograph (*metco-01.jpg*) was digitally corrupted.



*Photo #1: Old-Site Weir Box A to IWTP  
Taken By: Greg V. Arthur  
Date: 09/23/09*



*Photo #2: Old-Site Weir Box B to IWTP  
Taken By: Greg V. Arthur  
Date: 09/23/09*



*Photo #3: Old-Site Weir Box C to IWTP  
Taken By: Greg V. Arthur  
Date: 09/23/09*



*Photo #4: Old-Site Weir Box D to IWTP  
Taken By: Greg V. Arthur  
Date: 09/23/09*





Additional photographs taken during this inspection are depicted below.

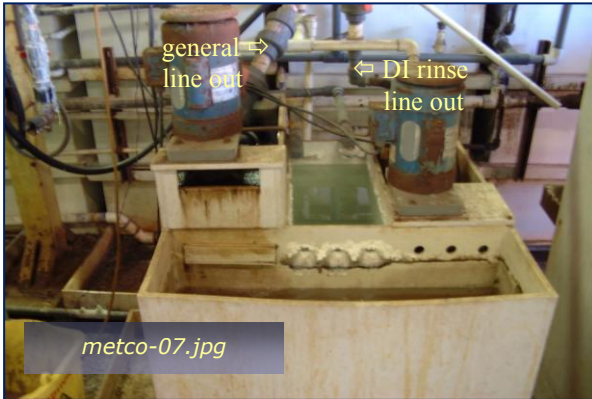


Photo #5: Old-site Weir Box E to IWTP  
Taken By: Greg V. Arthur  
Date: 09/23/09

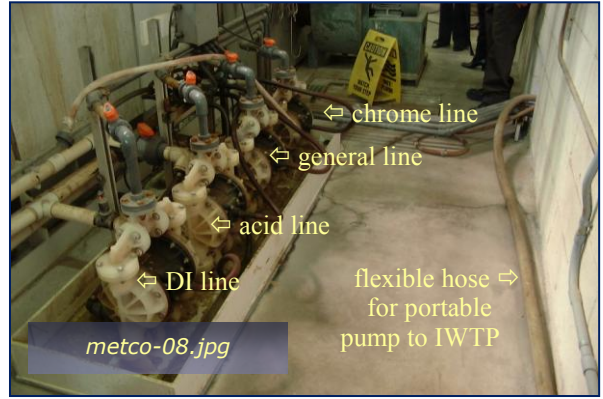


Photo #6: New-site Transfer Station to IWTP  
Taken By: Greg V. Arthur  
Date: 09/23/09



Photo #7: IWTP Equalization Tanks  
Taken By: Greg V. Arthur  
Date: 09/23/09



Photo #8: IWTP Unit Processes  
Taken By: Greg V. Arthur  
Date: 09/23/09

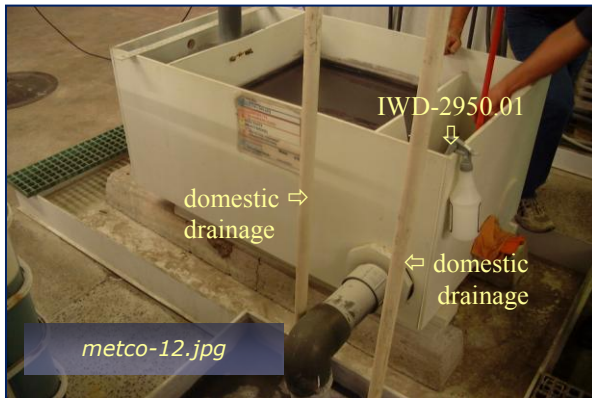


Photo #9: IWD-2950.01 Compliance Sample Box  
Taken By: Greg V. Arthur  
Date: 09/23/09



## 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**

The Federal new source metal finishing standards in 40 CFR 433 apply to the process wastewater discharges from Metco Metal Finishing. The standards for cyanide apply without adjustment by default because no cyanide-bearing flows have been identified as of yet. The Phoenix permit accurately applied the local limits and Federal standards. The application of Federal categorical standards, national prohibitions, and local limits was determined through visual inspection. *See* Appendix 3 on page 19 of this report for the permit limits.

### **Requirements**

- The permit must prohibit dilution as a substitute for any treatment that is necessary to comply with Federal standards.

### **Recommendations**

- Metco Metal Finishing should determine the percentage of the discharge through IWD-2950.01 (1) qualifying as dilution waters and (2) generated by cyanide-bearing sources.
- Metco Metal Finishing should verify that all wastewaters discharging downstream from IWD-2950.01 qualify as unregulated under the Federal standards.

## 2.1 Classification by Federal Point Source Category

Metco Metal Finishing qualifies as a metal finisher subject to the new sources for metal finishing in 40 CFR 433. The Phoenix permit correctly applied the new source standards. The Federal rules in 40 CFR 403.6 also define domestic sewage and non-contact waters as dilution waters.

New or Existing Sources – All of the Federally regulated operations at Metco Metal Finishing qualify as new sources since all operations began after 1996.

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.

## 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 Phoenix local limits apply to non-domestic discharges in the service areas of the City treatment plants.

## 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 new source 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, such as cleaning, associated with metal finishing and specifically listed in 40 CFR 433.10(a). If any of the core operations are performed, the new source metal finishing standards apply to discharges from any of the new source core or associated operations. As a result, the metal finishing standards apply to all of the process wastewater discharges to IWD-2950.01.

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).

Adjustments – See Section 2.4 on page 9 of this report for the adjustments in the standards for multiple categories, dilution, cyanide, and toxic organics monitoring.

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



## 2.4 Combined Federal Standards and Adjustments

Multiple Categories – No adjustments are necessary since only the Federal standards in 40 CFR 433 for new sources apply to the sewer discharge at IWD-2950.01.

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 preconditioning, boiler blowdown, and domestic sewage. These flows, specifically listed as dilution waters in 40 CFR 403.6(e), were not identified during this inspection nor in the permit. As a result, the Federal standards do not need to be adjusted unless qualifying flows are identified.

Cyanide Standards – The Federal standards in 40 CFR 433 apply cyanide standards to just cyanide-bearing wastewaters after cyanide treatment. This causes the downward adjustment of the standards proportionally to dilution from non-cyanide-bearing flows. Since cyanide-bearing wastewaters are not identified as discharging to the sewers, the Phoenix permit by default correctly applies cyanide standards without adjustment to IWD-2950.01. If there are cyanides (ex: chem-films with ferro-cyanides), then adjusted standards for cyanide apply.

Toxic Organics Standards – The Federal standards in 40 CFR 433.12 also allow facilities with an approved toxic organics management plan to certify instead of sample for toxic organics. Metco Metal Finishing self-monitors for total toxic organics twice per year.

## 2.6 Federal Prohibitions

The Federal standards in 40 CFR 403.6(d) and 403.17(d) prohibit dilution as a substitute for treatment, and bypassing of any treatment necessary to comply with standards. The City of Phoenix sewer use ordinance establishes the prohibition against the dilution as a substitute for treatment (§28-8g), but not for the bypassing treatment necessary to comply. The ordinance does establish related provisions for protection from accidental discharges (§28-53).

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

The permit identifies the weir box flume inside the facility as the location of the compliance sampling point (designated as IWD-2950.01). Federal categorical pretreatment standards apply end-of-process-after-treatment to all Federally-regulated discharges while local limits and the national prohibitions apply end-of-pipe to non-domestic flows. IWD-2950.01 is both a suitable end-of-process-after-treatment sample point representative of the day-to-day discharge of Federally-regulated wastewaters, and a suitable end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges.

Sampling Protocols – The national prohibitions are instantaneous-maximums comparable to samples of any length. Federal categorical pretreatment standards are daily-maximums comparable to 24-hour composites. The 24-hour composites can be replaced with single grabs or manually-composited grabs representative of the sampling day's discharge. The City of Phoenix permit specifies these sampling protocols by parameter (page 2 of 5).



### 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).*

Metco Metal Finishing employs wastewater treatment equivalent to the models used in originally setting the Federal standards. A number of excellent built-in controls also further improve reliability and performance, most notably the redundant treatment steps, segregation by type, and the consistent use of reaction end-point metering. As a result, with one exceptional period in September 2008, Metco Metal Finishing consistently complied with the Federal standards. *See* Section 2.0 on page 7 of this report. *Also* see Appendices 4 and 5 on pages 20 and 21 of this report for a summary of the compliance sampling and violations.

#### ***Requirements***

- The cause of the three consecutive days of treatment failure in September 2008 should be determined and prevented.

#### ***Recommendations***

- Hard-piping and permanent standpipe stations should be established for the delivery of the spents to the equalization tanks in order to eliminate the use of long flexible hosing.
- The chrome reduction step should be operated under acidic conditions (pH ~2.0 s.u.).
- One of the dual metals precipitation steps could be operated at a pH ~9.0-9.2 for the effective formation of insoluble zinc hydroxides.

### 3.1 Sampling Results

The two-year sample record consists of bimonthly to semiannual self-monitoring (depending on pollutant), and bimonthly sampling collected by Phoenix. Nearly all samples collected from IWD-2950.01 were 24-hour composites.

### 3.2 Best-Available-Technology Treatment

All process-related wastewaters generated by Metco Metal Finishing, an average of 27,000 gpd, discharge from the industrial wastewater treatment plant through the main sewer



connection. Metco Metal Finishing is designed and operated with best-available-technology (“BAT”) model treatment for these discharges. Both cyanide-copper plating and trivalent chromium plating are closed-loop with rinses collected at solution make-up and solution spents hauled off-site as the only outlet. Three consecutive days of failed treatment in September 2008 accounts for 16 of 19 permit violations of Federal standards over the 25 months from September 2007 through September 2009. Upon omission of these spikes as outlier events, the sampling results for IWD-2950.01 consistently comply with Federal standards, with average and calculated 99th% peak concentrations of 0.002 and 0.014 mg/l cadmium, 0.122 and 0.423 mg/l chromium, 0.059 and 0.263 mg/l copper, <0.050 mg/l lead, 0.391 and 2.030 mg/l nickel, 0.013 and 0.142 mg/l silver, 0.314 and 2.462 mg/l zinc, 0.021 and 0.083 mg/l total cyanide, and 0.042 and 0.132 mg/l total toxic organics.

The spikes in September 2008 indicate the outlier probability of violations of the Federal standards to be ~5-15%. The sampling results with the spikes omitted indicate that the statistical probabilities of violating any of the Federal standards are essentially 0% for any sampling day or any monthly-average. As a result, if the cause of the outlier spikes is determined and corrected, then not only is the treatment in-place equivalent in design to the model treatment but there are operational controls which would be expected to significantly further improve performance. A few minor deficiencies in the design and operation were observed during this inspection. The improvements (+) and deficiencies (-) are listed below.

- + Closed-loop isolation of trivalent chromium and cyanide-copper plating steps.
- + Segregated handling by strength and type through dedicated collection and metering through treatment.
- + Dual-stage metals precipitation.
- + Separate handling of the cyanide-bearing and electroless nickel spents.
- + Final discharge through tertiary ultrafiltration and pH testing prior to discharge.
- + Excellent reaction end-point metering.
- + First and second shift wastewater treatment operators.
- + Treatment operations including reaction end-point metering are SCADA telemetered.
- + Comprehensive secondary containment.
- Chrome reduction does not function at alkaline or neutral pHs (target should be 2.0 s.u.).
- Zinc precipitation only occurs effectively in a narrow pH range between 9.0 to 9.2 s.u.
- Chemically-aided Lamella clarification is more effective for metals precipitation settling.
- Filter press filtrate returns from electroless nickel batch treatment interferes with settling.
- Spent solutions are delivered by portable pump and hosing to the collection sumps.

### **3.4 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 particular, this prohibition applies when 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 evidence of “dilution as a substitute for treatment” since Metco Metal Finishing does not meet both conditions of non-compliance. Specifically, the first condition is not met since all Federally-regulated waters discharge through BAT model treatment.

### **3.5 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 Metco Metal Finishing. In particular, the delivery of all waste streams was observed to lead to treatment and discharge through the permitted sample point. However, the delivery of spents involves portable pumps and long flexible hosing which makes an inadvertent bypassing of treatment possible.





#### 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).*

With one exceptional period in September 2008, the sample record indicates that Metco Metal Finishing consistently complied with its local limits for metals, cyanide, organics, and pH. The sample record also indicates that compliance with the Federal standards would be expected to result in compliance with local limits. *See* Appendices 4 and 5 on pages 20 and 21 of this report. *Also* see Sections 3.0 and 5.0 on pages 10 and 15 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 and 23rd Avenue wastewater treatment plants through consistent compliance with their 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 – There were violations of the local limits during one exceptional period in September 2008. Otherwise, there were no violations of the local limits for arsenic, cadmium, copper, lead, mercury, selenium, silver, zinc, and cyanide. There is no evidence that these discharge spikes resulted in the operational interference of the Phoenix collection systems and wastewater treatment plants.

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

Metals and Cyanide – There were violations of the local limits during one exceptional period in September 2008. Otherwise, there were no violations of the local limits for arsenic, cadmium, copper, lead, mercury, selenium, silver, zinc, and cyanide. There is no evidence that these discharge spikes resulted in a pass-through of pollutants from the Phoenix wastewater treatment plants to the receiving waters.

Toxic Organics – 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-2950.01 is composed of treated wastewaters controlled through a final pH adjustment step, effluent equalization, and pH testing prior to discharge. For these reasons, the final discharge through IWD-2950.01 does not need to have daily discharge 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 – Metco Metal Finishing has successfully fulfilled the self-monitoring requirements set forth in the city permit. Over the a recent two year period, the sample record for IWD-2950.01, shows that Metco Metal Finishing (1) submitted sample results for all permit listed parameters at the frequencies set forth in the permit, (2) collected all samples from the designated compliance sampling points, and (3) correctly obtained 24-hour composites for metals and grabs for the other pollutants. It was not determined in this inspection whether appropriate chain-of-custody procedures were followed.

Representativeness – The sample record for IWD-2950.01 appears to be representative of the discharge to the sewers over the sampling day and the six-month reporting period. Some pollutants unregulated by the Federal standards and present at concentrations well below the local limits can be self-monitored less frequently.

### ***Requirements***

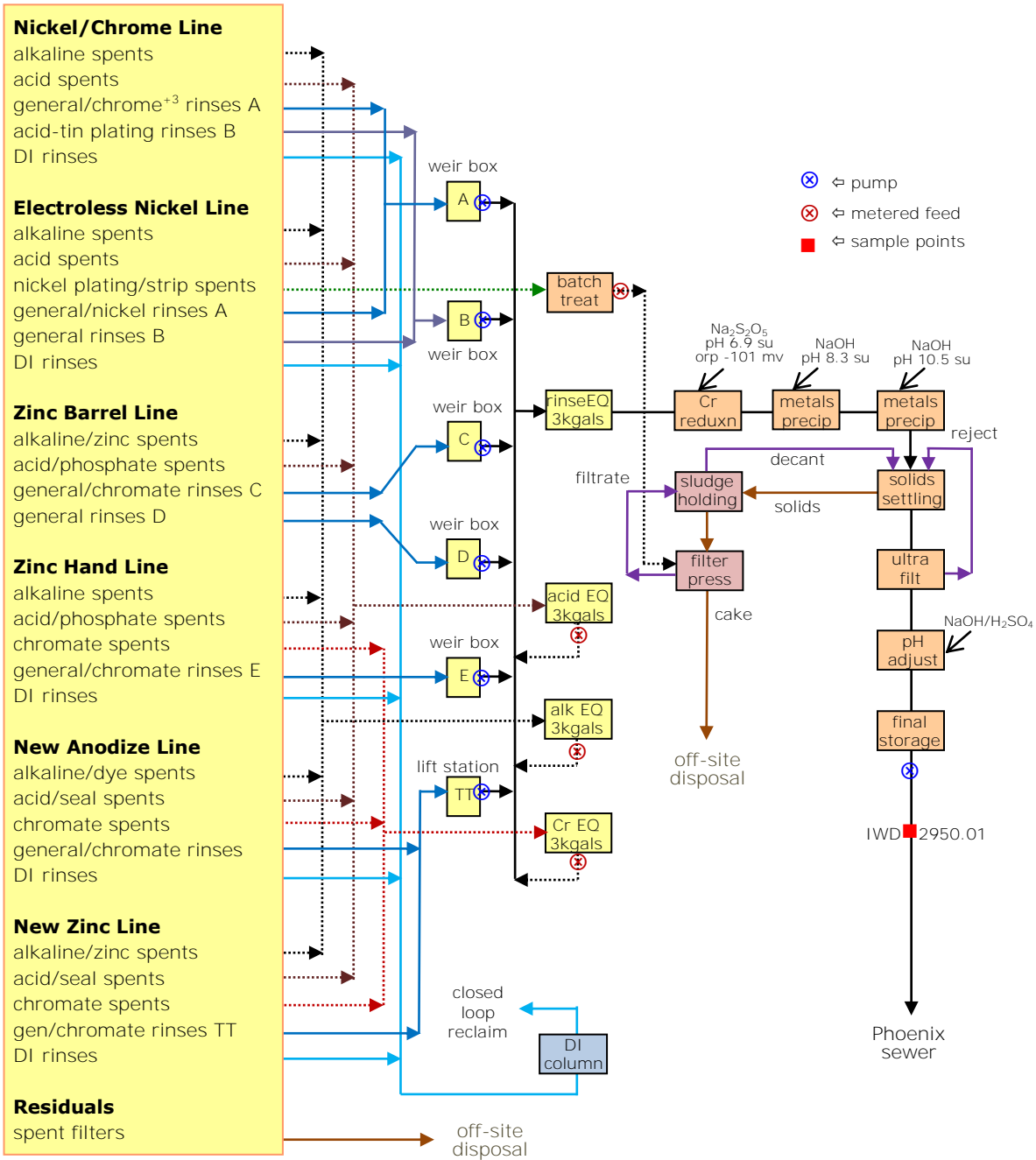
- *See* Appendix 3 on page 19 of this report for the self-monitoring and city monitoring requirements for that would be considered to be representative of the discharges.

### ***Recommendations***

- Self-certification statements should include copies of the hazardous waste manifests documenting the off-hauling of spents, and residuals.



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





<b>Appendix 2</b>						
<b>Metco Metal Finishing - Tank Inventory, Tank Number, and Delivery Method</b>						
Delivery ✓	Tank Designations and Contents			Delivery ✓	Tank Designations and Contents	
Decorative Nickel Line			Electroless Nickel Line (continued)			
PP&H	T42	alkaline soak cleaner	PP&H	EN028	alkaline soap cleaner	
PP&H	T105	alkaline electroclean	WeirBox-B	EN027/26	1°/2° cascade on-demand	
WeirBox-A	T45	1° cascade on-demand	PP&H	EN025	HNO <sub>3</sub> -acid passivation	
PP&H	T107	HCl-acid pickling	PP&H	EN024	HNO <sub>3</sub> -acid passivation	
PP&H	T108	HCl-acid pickling	Batch-Ni	EN023	HNO <sub>3</sub> -acid rack strip	
WeirBox-A	T109	1° cascade on-demand	PP&H	EN022	bisulfate zincate strip	
PP&H	T101	H <sub>3</sub> PO <sub>4</sub> -acid bright dip	WeirBox-B	EN021/20	1°/2° cascade on-demand	
Make-Up	T101A	1° drag-out for T101	PP&H	EN019	alkaline zincate coating	
Adds Only	T9 ✧	cyanide-copper strike	WeirBox-B	EN018/17	1°/2° cascade on-demand	
Make-Up	T302 ✧	1° drag-out for T9	PP&H	BD002	HNO <sub>3</sub> -acid desmut	
Make-Up	T86AB ✧	2°/3° drag-outs for T9	WeirBox-B	BD001	1° cascade on-demand	
Adds Only	T14	acid-tin plating	PP&H	BD005	H <sub>3</sub> PO <sub>4</sub> -acid bright dip	
WeirBox-B	T54	1° cascade on-demand	WeirBox-B	BD006/7	1°/2° cascade on-demand	
Adds Only	T114	H <sub>2</sub> SO <sub>4</sub> -acid deactivation	PP&H	BD008	alkaline soak cleaner	
Adds Only	T113	bright-nickel plating	PP&H	BD011	NH <sub>4</sub> OH strip	
Make-Up	T115A	1° drag-out for T113	PP&H	BD012	H <sub>2</sub> SO <sub>4</sub> -acid predip	
WeirBox-A	T115BC	2° cascade on-demand	WeirBox-B	BD13/14	1°/2° cascade on-demand	
Adds Only	T142 ◆	trivalent chrome plating	PP&H	BD015	HNO <sub>3</sub> -acid passivation	
Make-Up	T303 ◆	1° drag-out for T142	WeirBox-B	BD016/17	1°/2° cascade on-demand	
WeirBox-A	T22/23 ◆	2° cascade on-demand	PP&H	BD018	ultrasonic cleaner	
Recirc	T50	DI closed-loop hot rinse	PP&H	BD021	HCl-acid pickling	
Electroless Nickel Line			Make-Up	BD020/19	1°/2° drag-out for BD021	
PP&H	EN001	alkaline soap cleaner	Unused	BD022/23	3°/4° drag-out for BD021	
PP&H	EN002	alkaline electroclean	Recirc	EN029	DI final rinse	
WeirBox-A	EN003/4	1°/2° cascade on-demand	Zinc Barrel Line			
PP&H	EN005	HCl-acid pickling	PP&H	B001	alkaline electrocleaner	
PP&H	EN006	HCl-acid pickling	PP&H	B002	alkaline soak cleaner	
WeirBox-A	EN007/8	1°/2° cascade on-demand	WeirBox-D	B003/4	1°/2° cascade on-demand	
Batch-eNi	EN009	electroless nickel plating	PP&H	B005	HCl-acid descale	
Batch-eNi	EN010	electroless nickel plating	PP&H	B006	HCl-acid descale	
Batch-eNi	EN011	electroless nickel plating	WeirBox-D	B007/8	1°/2° cascade on-demand	
WeirBox-A	EN012/13	1°/2° cascade on-demand	PP&H	B009	zinc phosphating	
Batch-Ni	EN014	nickel strike	WeirBox-D	B010/11	1°/2° cascade on-demand	
PP&H	EN015	acid activation	PP&H	B012	alkaline-zinc plating	
Make-Up	EN016	1° drag-out for EN015	WeirBox-C	B013/14	1°/2° cascade on-demand	
✧ cyanide-bearing wastewaters			✓ WeirBox-A – sump A delivery to IWTP			
◆ chromium-bearing wastewaters			✓ WeirBox-B – sump B delivery to IWTP			
			✓ WeirBox-D – sump D delivery to IWTP			
			✓ Batch-Ni – tote delivery to batch treat for nickel			
✓ Adds Only – adds only so no discharge to IWTP			✓ Batch-eNi – tote delivery to batch treat e-less Ni			
✓ PP&H – portable pump/hose delivery to IWTP			✓ Recirc – closed-loop recirculating handling			





<b>Appendix 2</b>						
<b>Metco Metal Finishing - Tank Inventory, Tank Number, and Delivery Method</b>						
Delivery ✓	Tank Designations and Contents			Delivery ✓	Tank Designations and Contents	
Zinc Barrel Line (continued)			New Site Anodizing Line (continued)			
Adds Only	B016 ◆	clear chromate coating	TransSta	AL010	3° static for AL008	
Adds Only	B017 ◆	yellow iridite chrome	TransSta	AL011	HNO <sub>3</sub> -acid desmut	
WeirBox-C	B018/19◆	1°/2° cascade on-demand	TransSta	AL012	nickel acetate sealing	
Unused	B020 ◆	2° DI on-demand	TransSta	AL013	1° overflow for AL012	
Adds Only	B021 ◆	clear chromate coating	TransSta	AL014	black dye	
WeirBox-C	B022/23◆	1°/2° cascade on-demand	TransSta	AL015	1° overflow for AL014	
Adds Only	B024	Teflon coating	TransSta	AL016	HNO <sub>3</sub> -acid predip	
Make-Up	EN007/8	1° drag-out for B024	TransSta	AL017	1°/2° cascade on-demand	
Zinc Hand Line			TransSta	AL018	H <sub>2</sub> SO <sub>4</sub> Type II anodizing	
PP&H	ZT001	alkaline soak cleaner	TransSta	AL019	1° overflow for AL020	
PP&H	ZT002	alkaline electrocleaner	TransSta	AL020	red dye	
WeirBox-E	ZT003/4	1°/2° cascade on-demand	TransSta	AL021	gold dye	
PP&H	ZT005	HCl-acid pickling	TransSta	AL022	blue dye	
PP&H	ZT006	HCl-acid pickling	TransSta	AL005 ◆	clear chromate coating	
WeirBox-E	ZT007/8	1°/2° cascade on-demand	TransSta	AL003 ◆	1° overflow for AL014	
PP&H	ZT009	alkaline deactivation	TransSta	AL004 ◆	yellow chromate coating	
Adds Only	ZT010	alkaline-zinc plating	TransSta	AL002 ◆	hot DI rinse	
Adds Only	ZT011 ◆	black chromate coating	New Site Zinc Line			
WeirBox-E	ZT012 ◆	1° DI on-demand	TransSta	AZ007	alkaline cleaning	
PP&H	ZT013	zinc phosphating	TransSta	AZ006	alkaline electrocleaner	
WeirBox-E	ZT014	1°/2° cascade on-demand	TransSta	AZ005	1°/2° cascade on-demand	
PP&H	ZT016	HNO <sub>3</sub> -acid predip	TransSta	AZ004	NaOH predip	
Adds Only	ZT017 ◆	clear chromate coating	TransSta	AZ002	HCl-acid pickling	
PP&H	ZT018 ◆	olive chromate coating	TransSta	AZ003	1°/2° cascade on-demand	
PP&H	ZT019 ◆	olive chromate coating	TransSta	AZ008	alkaline-zinc plating	
WeirBox-E	ZT20/21◆	1°/2° cascade on-demand	TransSta	AZ009	1°/2° cascade on-demand	
Recirc	ZT022 ◆	DI hot rinse	TransSta	AZ010	HNO <sub>3</sub> -acid predip	
Make-Up	ZT038	zinc regeneration tank	TransSta	AZ011 ◆	clear chromate coating	
New Site Anodizing Line			TransSta	AZ012 ◆	yellow chromate coating	
PP&H	AL006	alkaline cleaner	TransSta	AZ013 ◆	1°/2° cascade on-demand	
PP&H	AL007	H <sub>3</sub> PO <sub>4</sub> -acid microetch	TransSta	AZ014 ◆	black chromate coating	
PP&H	AL008	NaOH etching	TransSta	AZ015	H <sub>2</sub> SO <sub>4</sub> /citric-acid post dip	
TransSta	AL009	1°/2° cascade on-demand	TransSta	AZ016	DI rinse	
◆ cyanide-bearing wastewaters			✓ WeirBox-C – sump C delivery to IWTP			
◆ chromium-bearing wastewaters			✓ WeirBox-D – sump D delivery to IWTP			
			✓ WeirBox-E – sump E delivery to IWTP			
✓ Adds Only – adds only so no discharge to IWTP			✓ Recirc – closed-loop recirculating handling			
✓ PP&H – portable pump/hose delivery to IWTP			✓ TransSta – Transfer station to IWTP			



<b>Appendix 3</b>						
<b>Sewer Discharge Standards and Limits for Metco Metal Finishing @ IWD-2950.01</b>						
Pollutants of concern	Fed stds (d-max)	Fed stds (mo-avg)	nat'l pro (instant)	local lim (inst/dmax)	monitoring frequency ①	
					discharger	city
arsenic	-	-	-	0.13	③	2/quarter
cadmium	0.11	0.07	-	0.047	2/month	2/quarter
chromium	2.77	1.71	-	-	2/month	2/quarter
copper	3.38	2.07	-	1.5	2/month	2/quarter
lead	0.69	0.43	-	0.41	1/quarter	2/quarter
mercury	-	-	-	0.0023	③	2/quarter
molybdenum	-	-	-	-	③	2/quarter
nickel	3.98	2.38	-	-	2/month	2/quarter
selenium	-	-	-	0.10	③	2/quarter
silver	0.43	0.24	-	1.2	1/quarter	2/quarter
zinc	2.61	1.48	-	3.5	2/month	2/month
amenable cyanide	0.86	0.32	-	-	n/a	n/a
total cyanide	1.20	0.65	-	2.0	1/quarter	1/six-mos
total toxic organics	2.13	-	-	-	1/six-mos ④	1/six-mos ④
benzene	-	-	-	0.035	③	1/six-mos
chloroform	-	-	-	2.0	③	1/six-mos
pesticides and PCBs	-	-	-	②	③	1/six-mos
BOD	-	-	-	-	③	1/quarter
TSS	-	-	-	-	③	1/quarter
TDS	-	-	-	-	③	1/quarter
flow (gpd)	-	-	-	50,000	2/month	n/a
pH (s.u.)	-	-	<5.0	5.0-10.5	1/week	1/quarter
explosivity	-	-	<140°F ⑤	<10% LEL	③	③

① Recommended reductions in green. Recommended increases in red.

② City ordinance prohibits the introduction of these pollutants in any amount.

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 sampling. A City inspection could then qualify as an independent determination.

⑤ Closed-cup flashpoint



**Appendix 4**  
**Wastewater Discharge Quality for Metco Metal Finishing @ IWD-2950.01**

Sample Record Summary for IWD-2950.01 (09/01/07-09/30/09)								
pollutants (µg/l)	effluent sampling results				violation rate ① ②			sample count
	mean	99th%	min	max	d-max	mo-av	instant	
arsenic	1.8	9.0	<5	12	0/18	n/a	n/a	18
cadmium	339	860	<2	1990	<b>2/37</b>	<b>1/15</b>	<b>2/37</b>	37
chromium	1296	13840	<5	30500	<b>2/37</b>	<b>1/15</b>	n/a	37
copper	686	7673	<10	17700	<b>2/40</b>	<b>1/18</b>	<b>2/40</b>	40
lead	<20	<50	<20	<50	0/30	0/15	0/30	30
mercury	<0.2	0.3	<0.2	0.5	n/a	n/a	0/22	22
molybdenum	20.6	113.6	<5	160	n/a	n/a	n/a	27
nickel	1606	16503	<20	40200	<b>2/40</b>	<b>2/18</b>	n/a	40
selenium	2.1	13.1	<1	19.1	n/a	n/a	0/22	22
silver	12.6	141.7	<5	302	0/30	0/15	0/30	30
zinc	26381	93230	<60	1210000	<b>4/70</b>	<b>2/23</b>	<b>4/70</b>	70
total cyanide	21.2	82.9	<10	97	0/14	0/12	0/14	14
total toxic organics	92.0	131.7	9.5	94.9	0/4	n/a	n/a	4
benzene	<5.0	<5.0	<5	<5	n/a	n/a	0/4	4
chloroform	32.1	111.6	7.9	81	n/a	n/a	0/4	4
pesticides and PCBs	<5.0	<5.0	<5	<5	n/a	n/a	0/4	4
BOD (mg/l)	18.6	37.3	<2	31	n/a	n/a	n/a	13
TSS (mg/l)	265	1699	<2.5	2220	n/a	n/a	n/a	13
TDS (mg/l)	6860	25052	560	25400	n/a	n/a	n/a	8
flow mo-avg (gpd)	26844	2874	16767	42343	n/a	n/a	0/8	8
pH (s.u.)	5.31 min – 7.72 median – 9.44 max				-	-	0/323	323

① Monthly averages calculated by calendar month of both self-monitoring and Phoenix sampling  
② Fed stds for metals compared only 24-hr composite samples. Local limits to all samples.



**Appendix 5**  
**Wastewater Discharge Quality for Metco Metal Finishing @ IWD-2950.01**

Federal Standard Violations (09/01/07-09/30/09)							
sample dates	type	sampler	point	Fed standards / local limits ①		viols	days
09/17/08	24-h	POTW	2950.01	cadmium -Fed d-max	0.11 mg/l	1.99	1
09/17/08	24-h	POTW	2950.01	chromium -Fed d-max	2.77 mg/l	30.5	1
09/17/08	24-h	POTW	2950.01	copper -Fed d-max	3.38 mg/l	17.7	1
09/17/08	24-h	POTW	2950.01	nickel -Fed d-max	3.98 mg/l	40.2	1
09/17/08	24-h	POTW	2950.01	zinc -Fed d-max	2.61 mg/l	1210.	1
09/18/08	24-h	POTW	2950.01	cadmium -Fed d-max	0.11 mg/l	0.59	1
09/18/08	24-h	POTW	2950.01	chromium -Fed d-max	2.77 mg/l	13.2	1
09/18/08	24-h	POTW+IU	2950.01	copper -Fed d-max	3.38 mg/l	7.47	1
09/18/08	24-h	POTW+IU	2950.01	nickel -Fed d-max	3.98 mg/l	7.25	1
09/18/08	24-h	POTW+IU	2950.01	zinc -Fed d-max	2.61 mg/l	219.3	1
09/19/08	24-h	POTW+IU	2950.01	zinc -Fed d-max	2.61 mg/l	63.8	1
Sep 2008	24-hr	POTW	2950.01	cadmium - Fed mo-avg	0.07 mg/l	0.86	30
Sep 2008	24-h	POTW	2950.01	chromium - Fed mo-avg	1.71 mg/l	14.6	30
Sep 2008	24-h	POTW+IU	2950.01	copper - Fed mo-avg	2.07 mg/l	6.34	30
Sep 2008	24-h	POTW+IU	2950.01	nickel - Fed mo-avg	2.38 mg/l	15.9	30
Sep 2008	24-h	POTW+IU	2950.01	zinc - Fed mo-avg	1.48 mg/l	389.7	30
11/03/08	24-h	IU	2950.01	zinc -Fed d-max	2.61 mg/l	6.79	1
Nov 2008	24-h	IU	2950.01	zinc - Fed mo-avg	1.48 mg/l	4.01	30
Aug 2009	24-h	POTW	2950.01	nickel - Fed mo-avg	2.38 mg/l	2.78	31
Local Limit Violations (09/01/07-09/30/09)							
09/17/08	24-h	POTW	2950.01	cadmium -local inst	0.047mg/l	1.99	1
09/17/08	24-h	POTW	2950.01	copper -local inst	3.38 mg/l	17.7	1
09/17/08	24-h	POTW	2950.01	zinc -local inst	2.61 mg/l	1210.	1
09/18/08	24-h	POTW	2950.01	cadmium -local inst	0.11 mg/l	0.59	1
09/18/08	24-h	POTW+IU	2950.01	copper -local inst	3.38 mg/l	7.47	1
09/18/08	24-h	POTW+IU	2950.01	zinc -local inst	2.61 mg/l	219.3	1
09/19/08	24-h	POTW+IU	2950.01	zinc -local inst	2.61 mg/l	63.8	1
11/03/08	24-h	IU	2950.01	zinc -local inst	2.61 mg/l	6.79	1
total days of violation ③							<b>233</b>

Statistical Violation Probabilities (09/01/07-09/30/09)				
violation probability ① ④	mean (µg/l)	std dev (µg/l)	statistical probability	percent
Fed - nickel (d-max)	µ = 391.3	σ = 703.4	α(3980) = 0.0000	~0%
Fed - zinc (d-max)	µ = 313.7	σ = 922.0	α(2610) = 0.0064	~1%

- ① Monthly averages calculated by calendar month of both self-monitoring and Phoenix sampling
- ② Fed stds for metals compared only 24-hr composite samples. Local limits to all samples.
- ③ Total does not double count sample results in violation of both Fed standards and local limits.
- ④ Sept 2008 spikes result in viol probabilities ~10%. Stats here are based on omission of spikes.