



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

December 7, 2005

In Reply Refer To: WTR-7

John Ortiz, Environmental Manager
Precision Anodizing & Plating, Incorporated
1601 North Miller Street
Anaheim, California 92806-1417

Re: June 20, 2005 Clean Water Act Inspection

Dear Mr. Ortiz:

Enclosed is the December 7, 2005 report for our June 20 inspection of Precision Anodizing & Plating. Please submit a short response to the findings in Sections 2 through 5 of this report, to EPA, Orange County, and the Regional Board, by January 30, 2006.

The main findings are summarized below:

- 1 The Orange County permit applied the correct Federal standards. The only Federal standards that apply are the job-shop electroplating standards for existing sources.
- 2 Incomplete treatment is the likely cause of the intermittent copper and total metals violations documented in the sample record, since the on-site treatment was found to be equivalent in design and performance to the models used in setting the Federal standards.
- 3 An opportunity to bypass treatment arises from the use of portable pumps and delivery hoses and from the apparent lack of an outlet from the reclaim system for salts build-up.
- 4 Performance has been greatly enhanced and the generation of waste streams greatly reduced through the on-site reclaim of the anodizing rinses and anodizing acid spents.

I certainly appreciate your helpfulness extended to me during this inspection. I remain available to Orange County and to you to assist in any way. Once again, thank you for your cooperation during this inspection. Please do not hesitate to call me at (415) 972-3504 or e-mail at arthur.greg@epa.gov.

Sincerely,

Original signed by:
Greg V. Arthur

Greg V. Arthur
CWA Compliance Office

Enclosure

cc: Roya Sohanaki, OCSD
Julio Lara, RWQCB-Santa Ana



U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION REPORT

Industrial User: Precision Anodizing & Plating, Incorporated
1601 North Miller Street, Santa Ana, California 92806-1417
40 CFR 413 Subparts A,D,E,F – Job-Shop Electroplating
40 CFR 433 Subpart A – Metal Finishing

Treatment Works: Orange County Sanitation District
Fountain Valley Wastewater Reclamation Plant No.1 and
Huntington Beach Wastewater Treatment Plant No.2
(NPDES Permit CA0110604)

Date of Inspection: June 20, 2005

Inspection Participants:

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

RWQCB-Santa Ana: Julio Lara, Water Resources Control Engineer, (951) 782-4901
Najah Amin, Water Resources Control Engineer, (951) 320-6362

Orange County SD: Roya Sohanaki, (714) 593-7437

Precision Anodizing: John Ortiz, Environmental Manager, (714) 996-1601
Gregg Halligan, Vice President, (714) 996-1601

Report Prepared By: Greg V. Arthur, Environmental Engineer
December 5, 2005

1.0 Scope and Purpose

On June 20, 2005, EPA, the California Regional Water Quality Control Board Santa Ana Region (“RWQCB”), and the Orange County Sanitation District (“OCSD”) conducted a compliance evaluation inspection of Precision Anodizing & Plating, Inc. in Santa Ana, California. 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.

Precision Anodizing & Plating is a significant industrial user (“SIU”) within the OCSD sewer service area whose compliance was assessed as part of a 2005 evaluation of the OCSD pretreatment program by the RWQCB, its contractor, Tetra Tech, and EPA. The inspection participants are listed on the title page. Arthur conducted the inspection of Precision Anodizing & Plating on June 20.

1.1 Process Description

Precision Anodizing & Plating is a job-shop metal finisher operating at 1601 North Miller Street in Anaheim, California. The metal finishing comprises two zinc-plating lines for steel parts, and three aluminum anodizing lines. Precision Anodizing & Plating does not perform chromic-acid anodizing nor cyanide-based zinc plating.

Anodizing	<ul style="list-style-type: none"> • anodize line – caustic etching, HNO₃-deoxidation, NH₄HF₂-etching, H₂SO₄-anodizing, chromium conversion coating, dyeing (<i>red, blue, violet, gold, green, olive, grey</i>), HNO₃-dye strip, HNO₃/NH₄HF₂-bright dip desmut • 10-foot line – caustic etching, HNO₃-deoxidation, H₂SO₄-anodizing, dyeing (<i>black</i>), nickel acetate seal, DI hot water seal • 16-foot line – alkaline soap cleaning, caustic etch, HNO₃-deoxidation, H₂SO₄-anodizing, chromate conversion coating, dyeing (<i>black, gold</i>), nickel acetate seal
Plating	<ul style="list-style-type: none"> • hand line – alkaline soap cleaning, caustic electrocleaning, HCl-activation, acid-zinc plating, HCl-zinc strip, chromate passivation, chromate conversion coating • main plating line – alkaline cleaning, caustic electrocleaning, HCl-activation, acid-zinc plating, chloride-zinc plating, HNO₃-deactivation, chromate passivation (<i>black, yellow, clear</i>), acetic-acid activation

Precision Anodizing & Plating began operation in 1974. The company vice president believes that there have been no added or changed metal finishing lines since 1984, although there is no way for EPA to confirm this. All new plumbing was installed in 2000 in order to incorporate the use of an industrial wastewater reuse unit involving reverse osmosis and electrocoagulation. Precision Anodizing & Plating discharges its treated non-domestic and

domestic wastewaters to the City of Anaheim domestic sewers to the Orange County wastewater treatment plants. There is a single sewer connection into the domestic sewers designated in this report by permit number as IWD-21575. See Appendix 1.

1.2 Facility SIC Code

Precision Anodizing & Plating is assigned the SIC code for electroplating, plating, polishing, anodizing, and coloring, (SIC 3471).

1.3 Facility Wastewater Sources

The metal finishing lines generate metal finishing spents, rinses, and drainage, as well as fume scrubber blowdown and reverse osmosis reject brines. The 2005 Orange County pre-permit inspection report provides a detailed list of the solution and rinse tanks on-site identified by tank number. However, a number of the tanks were found during this inspection to be operated differently and than described in the pre-permit inspection report. See Appendix 1.

Spent Solutions – The imparted contamination from the processing of parts and the progressive drop in solution strength results in the generation of spent solutions. Precision Anodizing & Plating hauls off-site for disposal the black chromate passivation spents and zinc-plating spents. The H₂SO₄-anodizing spents are regenerated on-site through membrane ultrafiltration. The other spents from etching, cleaning, deoxidation, passivation, acid activation, sealing, and dyes are batch treated on-site.

Spent Solutions		
Hauled Off-site	On-site Batch Treatment	On-site Acid Recovery
chloride-zinc plating acid-zinc plating black chromate passivation	alkaline/soap cleaning caustic etching NH ₄ HF ₂ -etching HCl-acid activation HCl-strip HNO ₃ -deoxidation HNO ₃ -passivation acetic acid activation yellow chromate passivation blue chromate passivation HNO ₃ -NH ₄ HF ₂ -bright dip chrome conversion coating dyes nickel acetate sealing	H ₂ SO ₄ -anodizing
No Sewer Discharge	Discharged @ IWD-21575	No Sewer Discharge

Static Rinses – Precision Anodizing & Plating follows many but not all of its metal finishing steps with static rinses some in countercurrent series. Nearly all static rinses are treated and discharged through flow-through chemical treatment or batch chemical treatment. Most of the static rinses identified during this inspection were listed as running rinses in the Orange County pre-permit inspection report. Some of the static rinses actually may be operated as drag-outs although that could not be determined in this inspection.

Static Rinses		
Flow-Through Treatment	On-site Batch Treatment	Solution Make-Up Returns
hot DI static rinses chem film statics electroclean 1°statics caustic etch statics yellow chromate passivate clear chromate passivation bright dip statics dye 1°static zinc plating statics HCl-activation static acetic-acid activation HNO ₃ -desmut/passivate HNO ₃ -deoxidation Cr-conversion coat 1°/2° anodizing statics	black chromate passivation	HNO ₃ -deox drag-out
Discharged @ IWD-21575	Discharged @ IWD-21575	No Sewer Discharge

Running Rinses – Precision Anodizing & Plating employs a few first and second stage low-overflow rinses. No spray rinses were observed during this inspection. All anodizing overflows are treated through the wastewater reclaim unit. The remaining running rinses are treated through the flow-through chemical treatment unit.

Running Rinses		
Flow-Through Treatment	On-site Batch Treatment	On-site Wastewater Reclaim
electroclean low-overflows dye low-overflows zinc plating low overflow alk cleaning low-overflow caustic etch low-overflows HNO ₃ -deox low-overflow HNO ₃ -activate low-ovrflw Cr-conversion coat 3° Ni-acetate low-overflow		anodizing low-overflows
Discharged @ IWD-21575	n/a	No Discharge Specified

Blowdowns and Tailwaters – Reverse osmosis reject brines and fume scrubber blowdown also are generated on-site and treated for discharge to the sewers.

Other Process Flows		
Flow-Through Treatment	On-Site Batch Treatment	Untreated
reverse osmosis brines fume scrubber blowdown		
Discharged @ IWD-21575	n/a	n/a

Domestic Sewage – Domestic sewage discharges into the City of Anaheim sewer lateral through separate connections downstream of the industrial wastewater connection.

1.4 Facility Process Wastewater Composition

The process wastewaters listed in section 1.3 above would be expected to contain chromium, copper, nickel, silver, zinc, ammonia, complexed cyanide, acidity, salts, dyes, and surfactants, as well as iron, aluminum, nitrates, free oils, sulfides, and suspended solids.

1.5 Facility Process Wastewater Treatment

Precision Anodizing & Plating operates two flow-through wastewater treatment units and two batch chemical treatment tanks to treat all generated spent solutions, static rinses, running rinses, brines and blowdowns. The 2004 Orange County annual report lists an annual average discharge of 82,000 gallons per day (“gpd”) to the sewers, although the reclaim of the reverse osmosis water is likely to greatly reduce discharge. See Appendix 1.

Delivery – Spent solutions and static rinses are delivered to batch treatment through the use of a portable sump pump and hoses. The rinses now feed into transfer tanks that allow the diversion of some or all of the flow away from the flow-through chemical treatment unit and to the reverse osmosis water reclaim unit. See the photos in section 1.7 of this report.

Flow-Through Chemical Treatment – Precision Anodizing & Plating provides conventional metals removal of the rinses through two parallel chemical treatment trains. Both provide influent equalization, metals hydroxide precipitation, and polymer-aided settling. One treatment trains also handles batch treated spents. Neither treatment train provides chrome reduction or cyanide destruction. The EPA inspector could not determine throughput.

Batch Treatment – Precision Anodizing & Plating also operates two batch treatment tanks to handle most spents. One provides chromium reduction and metals precipitation with the treated contents delivered by carboy to flow-through chemical treatment. The other is used for metals precipitation and unaided settling with the tank bottoms sent through a filter press and decant returned to the flow-through chemical treatment. The EPA inspector could not determine the volume handled through batch treatment.

Reverse Osmosis Reclaim – Precision Anodizing & Plating has the capability to reclaim over 40,000 gpd of rinse water. Reclaim consists of a lead reverse osmosis unit (RO Unit 1) producing ~28,000 gpd of RO water followed by low-TDS treatment of the RO reject brines. RO Unit 1 operates at a 50% reject rate generating ~14,000 gpd of RO reject brines. The RO Unit 1 reject brines and other general rinses proceed through sacrificial iron electrocoagulation to remove metals and other pollutants without the use of salts-forming reagents. Electric current causes iron anodes to electrolytically dissolve forming ferrous oxides and hydroxides. It also destabilizes other dissolved metals to form insoluble oxides/hydroxides and reduces others to insoluble elemental particles. The ferrous oxides then suppress the surface charges allowing particles to bind for flocculant-aided settling through an upflow plate clarifier. The clarifier sludges are thickened and filter pressed with the filtrate returned into the RO Unit 1 reject brine. The clarifier decant is polished through sand filtration and carbon adsorption before feeding through a scavenger unit (RO Unit 2). RO Unit 2 operates at a 20% reject rate which produces ~12,000 gpd of RO water for ozone disinfection and on-site reclaim, and ~2,400 gpd of RO reject brines. Precision Anodizing & Plating claims that the RO Unit 2 reject brines entirely return for re-treatment through electrocoagulation.

Acid Reclaim – Precision Anodizing & Plating reclaims anodizing sulfuric acids spends through ultrafiltration with the permeate delivered for to flow-through chemical treatment.

Residuals Handling – Filter cake from the two filter presses, and the zinc-plating and black-chromate passivation spends are hauled off-site as hazardous to Beatty, Nevada.

Sewer Discharge and Compliance Sampling – Treated wastewaters discharge to the sewers through a clarifier, which serves as the permitted compliance sampling point, IWD-21575.

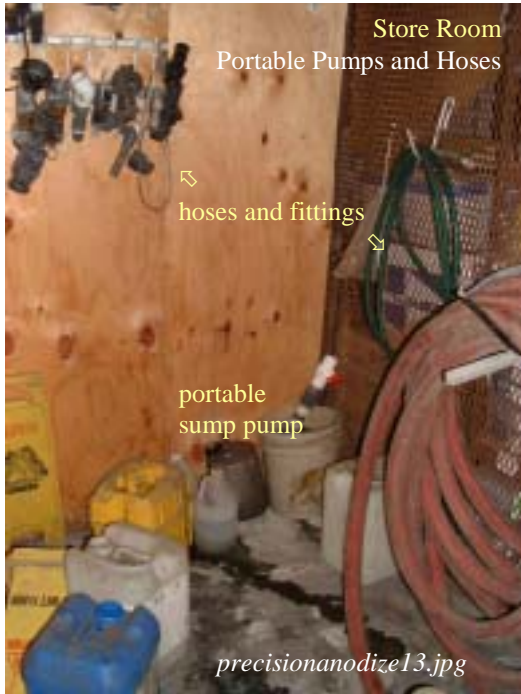
Operational Controls – Precision Anodizing & Plating benefits from the on-site reclaim of rinses and anodizing acids. However, the rinse reclaim does not have an apparent outlet for salts. A suitable outlet might be the periodic blowdown of RO Unit 2 reject brines through treatment to the sewers. Both reclaim methods improve the reliability and performance of wastewater treatment. The company has also implemented a few good operational controls that improve wastewater discharge quality. For example, flow-through treatment benefits from metered inflow, while batch treatment benefits from operating in batch mode and in the sequenced segregation of waste streams. The company has not extensively applied production-related controls, such as the use of multiple-staged static rinses, over-tank spray rinses, and deactivation rinses between processing steps of differing surface chemistry.

1.6 POTW Legal Authorities

Orange County Sanitation Districts – OCSD operates an EPA-approved pretreatment program as required by the State of California in the Santa Ana RWQCB's Waste Discharge Requirements, No. R8-2004-0062, reissued to OCSD in 2004, and serving as NPDES Permit No. CA0110604. As part of this, OCSD has established sewer use Ordinance No.1 that applies to all industrial users of its sewer system. Under this authority, Orange County issued an industrial user permit to Precision Anodizing & Plating, No. 2-1-575 covering the sewer discharge from IWD-21575.

1.7 Photo Documentation

Arthur took seven digital photographs during this inspection. The file names are *precisionanodize.7.jpg* through *precisionanodize13.jpg*. Four of the photographs are depicted below. The others not depicted were duplicates.



Top left shows the sump pump and spare hoses believed to be used to deliver spents to batch treatment (*precisionanodize13.jpg*). The other three show the three transfer tanks installed to allow the diversion of rinses from the anodizing lines and the zinc-plating line to the RO units for in-plant reuse (~8.jpg, ~9.jpg, and ~11.jpg).

Photos Taken by: Greg V. Arthur
Date: June 20, 2005



