Advice & Counsel

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Switching From 40CFR Part 413 To 40CFR Part 433

One of the options considered by the U.S. Environmental Protection Agency (EPA) in finalizing the MP&M Regulations is to require all jobshop electroplaters currently regulated under 40CFR Part 413, to meet 40CFR Part 433 instead. Last month we discussed several problems arising from such a regulation. This month we will discuss a real example (Company A—name provided upon request).

Introduction

Company A is located in a midwestern city. Its neighborhood is in the heart of an upscale gentrified portion of this city, with townhomes and rehabbed two- and three-bedroom flats that range up to 1.5 million dollars. When Company A located here, this neighborhood was a working class, blue-collar area. Company A occupies two separate buildings—one for production and one for offices. Both buildings are bordered by upscale housing (see photo). Obtaining a permit for modification or expansion of the property is not possible, because no land is available on any side of the existing property, and neighbors will object to any permit filing for such an endeavor.

Company A is located near new and renovated residential buildings.

Concentration of Metals & Total Cyanide Data

Parameter	4-D Avg.	1-D Max	Avg 413	Avg 433 NSPS	Avg 433 ESPS
Cadmium	0.25	0.36	0.7	0.07	0.26
Chromium	0.14	0.55	4.0	1.71	1.71
Copper	0.82	0.88	2.7	2.07	2.07
Lead	0.07	0.08	0.4	0.43	0.43
Nickel	0.62	0.75	2.6	2.38	2.38
Silver	<.05	<.05	0.7	0.24	0.24
Zinc	0.72	0.98	2.6	1.48	1.48
CN-T	0.18	0.24	1.0	-----	-----
CN-T		5.0*	----	0.65**	0.65**
CN-ATC		-9.66*		0.32***	0.32***

* Single grab sample taken at point of treatment during slow production
** Limit applies at point of treatment
*** Limits apply at point of treatment, with permission of POTW only

Company A offers numerous electroplated finishes, including cadmium, zinc, copper, electroless nickel, tin, tin-lead, tin-zinc, passivating, caustic etching and nickel plating. While some plating is conducted on racks, most of the production is conducted in barrels, resulting in high drag-out rates and concentrated wastewater streams.

Wastewater Treatment

Company A was one of the facilities EPA used back in the '80s to set the present Part 413 standards. The wastewater treatment system is designed for a maximum flow rate of 220,000 gpd and is approximately 25 years old. Approximately 50 percent of the raw wastewater treated by Company A contains cyanide. The wastewater treatment system utilizes the technology EPA considers "best available technology" (BAT) under MP&M, including pollution prevention practices, flow equalization, multiple-stage cyanide oxidation using hypochlorite, pH adjustment, clarification, and sand filtration.

The wastewater treatment system is located along an outside wall, and between that wall and several production lines. The effluent from this wastewater treatment system typically has the quality level (mg/L) shown in the accompanying table. The table shows the concentration of metals, and total cyanide data is from this company's continued compliance reports, while the CN-ATC values are from a single grab sample taken during abnormally low production levels.

As shown in the table, Company A would not comply with cadmium and cyanide total limits, if Part 433 NSPS (New Source Performance Standard) or PSES (Performance Standard Existing Sources) were applied, because of cyanide at the point of treatment requirement, and the low cadmium limits in part 433 vs. 413.

Further, the cyanide-ATC value is negative, which some POTWs find unacceptable.

Cadmium & Cyanide-ATC Compliance

Because the wastewater treatment system is surrounded by equipment and an outside wall (with a city sidewalk on the other side), any additional floor space required for additional wastewater treatment equipment must be created by the elimination of production space or rearrangement of existing equipment.

Option 1:

Eliminate Cadmium Plating

The average income from cadmium plating is $324,000/year over the last six years. Elimination of cadmium plating is estimated to cost the company $324,000 in sales and an estimated $65,000 in profits. Further, when a company stops offering a service, customers seek alternate providers and may decide to turn additional business over to the new source. Company A would, therefore, suffer additional sales and profit losses that cannot be quantified at this time, but may be as high as $20,000.

This option is not viable, because the economic impact would not allow Company A to remain in business.

Option 2:

Continue Cadmium Plating, Produce Floor Space Required

Cadmium compliance with PSES Part 433 standards may be achieved by adding a clarifier to treat cadmium plating rinsewater in two stages. The first stage would be a clarifier for settling treated cadmium-bearing waste. The effluent from this clarifier would be routed for secondary sedimentation in the existing clarifier. This treatment scheme has been successful in other facilities, but Company A would need to rearrange equipment or discontinue process lines to create the required additional floor space.

For additional assurance of compliance with cadmium limits, we would recommend that a cation exchange system be installed following the sand filter. This system would remove traces of dissolved cadmium not removed by the clarifier and filtration system, and would provide a measure of assurance that the 0.26 ppm 30-day average could be met on a routine basis. Budgetary estimates for additional equipment, installation and labor/chemicals, add up to $250,000. This assumes that there is floor space for re-location of existing processing equipment. A total of 200 ft^2 is required, 100 ft^2 for each additional equipment item. Some equipment would need to be relocated within the plant, and an exterior wall will need to be taken down and re-constructed to allow for equipment installation.

This plan assumes that a permit for tear down and re-construction of the exterior wall can be obtained (city officials have been reluctant in the past).

The additional equipment will require flocculent (for the clarifier) and acid/caustic for regeneration of the ion exchange system, plus additional maintenance costs and labor hours for operation of this equipment.

Annual Operating Costs

The annual cost impact on Company A would be approximately $58,000, including equipment amortization (15 years), increased labor for operation of the additional equipment, increased chemical costs, and increased cost of maintenance.

Despite the fact that the deadline for comments on MP&M and NODA are passed, your industry representatives are very much interested in how such a move will impact your jobshop. Let us hear from you. ***P&SF***