Preliminary Draft Staff Report
Proposed Amended Rule 1469 — Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations

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TABLE OF CONTENTS

CHAPTER 1: BACKGROUND
- INTRODUCTION 1-1
- BACKGROUND 1-1
- HEXAVALENT CHROMIUM 1-3
- REGULATORY HISTORY 1-4
- AMBIENT AIR MONITORING NEAR CHROMIC ACID 1-8
  - ANODIZING FACILITIES 1-10
- AFFECTED RULE 1469 FACILITIES 1-10
- PROCESS DESCRIPTION 1-11
- SCAQMD SAMPLING 1-13
- SUMMARY OF SOURCE TEST RESULTS FOR PLATING AND
  - ANODIZING TANKS 1-17
- SITE VISITS 1-19
- NEED FOR PROPOSED AMENDMENTS TO RULE 1469 1-21
- CONTROL TECHNOLOGIES 1-22

CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULE 1469
- PROPOSED AMENDMENTS TO RULE 1469 2-1

CHAPTER 3: IMPACT ASSESSMENT
- AFFECTED SOURCES 3-1
- EMISSION IMPACT 3-1
- CALIFORNIA ENVIRONMENTAL QUALITY ACT 3-1
- SOCIOECONOMIC IMPACT ASSESSMENT 3-1
- DRAFT FINDINGS UNDER CALIFORNIA HEALTH
  - AND SAFETY CODE SECTION 40727 3-1
- COMPARATIVE ANALYSIS 3-2

REFERENCES  R-1
TABLES AND FIGURES

**Figure 1-1:** Annual Average Hexavalent Chromium Levels at Newport Beach Facility  
**Figure 1-2:** Distribution of Most Recent Source Tests  
**Figure 1-3:** Slot Velocity Measurements of Emission Collection Systems at Multiple Facilities  
**Table 1-1:** SCAQMD Sample Results of Sealing Tanks  
**Table 1-2:** SCAQMD Sample Results of Chromate Conversion and Dye Tanks  
**Table 1-3:** SCAQMD Sample Results of Rinse, Cleaner, and Desmutt Tanks  
**Table 1-4:** SCAQMD Sample Results of Passivation, Etch, Neutralizer, and Stripping Tanks  
**Table 1-5:** Certified Hard Chrome Plating Fume Suppressants  
**Table 1-6:** Certified Chromic Acid Anodizing/Decorative Chrome Plating Fume Suppressants  
**Table 2-1:** Hexavalent Chromium Emission Limits for Existing Tanks
EXECUTIVE SUMMARY

Rule 1169 – Hexavalent Chromium – Chrome Plating and Chromic Acid Anodizing was adopted June, 3, 1988 and applies to chromium electroplating (hard and decorative) and chromic acid anodizing processes. On October 9, 1998, Rule 1169 was repealed and provisions were incorporated in Rule 1469 – Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations as Regulation XIV. This regulation includes rules regulating toxics and non-criteria pollutants.

Based on ambient monitoring data near several Rule 1469 facilities, sampling, and emissions testing depending on the concentration of hexavalent chromium in a tank, application of heat and/or air sparging can create emissions from the tank. PAR 1469 addresses tanks that were not previously known to be sources of hexavalent chromium emissions and has requirements to help minimize the release of fugitive emissions from these operations such as building enclosures, best management practices, and housekeeping provisions. PAR 1469 also has additional provisions to ensure continuous proper operation of point source pollution controls and contingency provisions to add pollution controls for a building enclosure for any facility that has repeated non-compliance with the point source emission requirements.

The proposed rule amendment also incorporates the changes made to the United States Environmental Protection Agency’s (USEPA) Chrome Plating NESHAP amended in September 2012. The NESHAP achieves further hexavalent chromium emission reductions by requiring more stringent emission limits for all facilities. In addition to emission limit reductions, housekeeping measures have also been made more stringent. For facilities that utilize chemical fume suppressants, surface tension limits have been lowered. Under Title 42 of the United States Code (U.S.C.), Section 7416, SCAQMD has the authority to either enforce equally effective or more stringent regulations than the NESHAP. Under Health and Safety Code (H&SC) Section 39666(d), SCAQMD has the authority to either enforce equally effective or more stringent regulations than the NESHAP or the state ATCM.

This Draft Staff Report is organized into three chapters. Chapter 1 provides background information regarding Proposed Amended Rule 1469 and provides a general description of electroplating and chromic acid anodizing operations and associated hexavalent chromium generating tanks. Chapter 1 also provides the results of ambient monitoring and emissions testing that SCAQMD staff has conducted at and near Rule 1469 facilities. Chapter 2 provides a summary and explanation of provisions in Proposed Amended Rule 1469. Chapter 3 provides an impact assessment and will include the socioeconomic impact analysis, Draft Findings, and the Comparative Analysis of the proposed amended rule.
CHAPTER 1: BACKGROUND

INTRODUCTION
BACKGROUND
HEXAVALENT CHROMIUM
REGULATORY HISTORY
AMBIENT MONITORING NEAR CHROMIC ACID ANODIZING FACILITIES
AFFECTED RULE 1469 FACILITIES
PROCESS DESCRIPTION
SCAQMD SAMPLING
SUMMARY OF SOURCE TEST RESULTS FOR PLATING AND ANODIZING TANKS
SITE VISITS
NEED FOR PROPOSED AMENDMENTS TO RULE 1469
CONTROL TECHNOLOGIES
INTRODUCTION
Rule 1469 establishes emission limits for hard and decorative electroplating and chromic acid anodizing based on throughputs and proximity to sensitive receptors, requires ongoing monitoring, initial performance testing of add-on control devices, housekeeping, reporting, and recordkeeping requirements. The most recent amendment in 2008 incorporated the most stringent requirements of the amended state Air Toxics Control Measure (ATCM) for Chrome Plating and Chromic Acid Anodizing Operations. The state ATCM required additional provisions to minimize hexavalent chromium emissions from compressed air cleaning, requirements for new facilities, record retention, and increased monitoring of air pollution controls.

Proposed Amended Rule 1469 – Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations (PAR 1469) is designed to reduce point sources that were previously not known to be significant sources of hexavalent chromium and establish additional provisions to minimize release of fugitive hexavalent chromium emissions from electroplating and chromic acid anodizing operations and associated processes. Off-site ambient monitoring and source testing near three chromic acid anodizing facilities identified process tanks not currently regulated under Rule 1469 that are sources of hexavalent chromium emissions. These tanks need additional emission controls. Based on results from ambient monitoring and additional emissions testing and sampling, PAR 1469 establishes new requirements for certain hexavalent chromium generating process tanks that are associated with electroplating and chromic acid anodizing operations, and incorporates additional requirements for building enclosures, more comprehensive housekeeping requirements, periodic source testing, and monitoring and reporting requirements to better control point and fugitive hexavalent chromium emissions. Amendments to Rule 1469 are also designed to harmonize with the 2012 National Emission Standards for Hazardous Air Pollutant Emissions (NESHAP) for Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks.

BACKGROUND
Rule 1169 – Hexavalent Chromium – Chrome Plating and Chromic Acid Anodizing was adopted June, 3, 1988 and applies to chromium electroplating (hard and decorative) and chromic acid anodizing processes. On October 9, 1998, Rule 1169 was repealed and provisions were incorporated in Rule 1469 – Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations as Regulation XIV. This regulation includes rules regulating toxics and non-criteria pollutants.

SCAQMD staff initiated rulemaking for this proposed amendment in 2015 as a result of findings from air monitoring and sampling near Hixson Metal Finishing in Newport Beach. SCAQMD staff had been conducting air monitoring near Hixson since 2009. In 2012 and 2013, levels of hexavalent chromium increased. These increases triggered a series of further evaluations which identified sources within Hixson as the source of elevated levels of the hexavalent chromium emissions. SCAQMD staff conducted additional monitoring and sampling, and engineering evaluations. They identified several conditions that contributed to the elevated hexavalent chromium levels, cross-drafts in the building that housed the chromic acid anodizing process that allowed emissions to flow out of the building and also interfered with the collection efficiency of
pollution controls, and high hexavalent chromium emissions from a process tank that was not currently regulated under Rule 1469, a heated sodium dichromate seal tank. SCAQMD and Hixson entered into a stipulated Order for Abatement requiring Hixson to shut down when ambient monitors detect a rolling average exceeding a specified level. As a result, Hixson implemented significant changes to address hexavalent chromium emissions: additional pollution controls for its chromic acid anodizing process line (including the heated sodium dichromate seal tank), construction of a building enclosure under negative air vented to pollution controls, and other improvements. Average levels of hexavalent chromium near Hixson have greatly declined since Hixson modified their operations.

In 2015, SCAQMD rules staff began site visits at other Rule 1469 facilities to get a better understanding of current operating conditions – types of building enclosures, housekeeping practices, evaluation of other process tanks that can also be sources of hexavalent chromium emissions similar to a heated sodium dichromate seal tank. During this initial phase of the rule development process, SCAQMD in a separate project was conducting air monitoring in the city of Paramount to investigate potential sources of hexavalent chromium near a metal forging facility. In October 2016, SCAQMD expanded its monitoring network in Paramount and began monitoring near a chromic acid anodizing facility - Anaplex. Initial results of hexavalent chromium were 10.96 ng/m$^3$ near Anaplex. Additional monitoring and sampling again pointed to a heated sodium dichromate seal tank, combined with cross-drafts that allowed emissions to flow directly out of the Anaplex building.

Based on ambient monitoring data, sampling, and emissions testing depending on the concentration of hexavalent chromium in a tank, application of heat and/or air sparging can create emissions from the tank. PAR 1469 addresses tanks that were not previously known to be sources of hexavalent chromium emissions. It requires building enclosures, best management practices, and housekeeping provisions to help minimize the release of fugitive emissions from these operations. PAR 1469 also has provisions to ensure continuous proper operation of point source pollution controls.

The proposed rule amendment also incorporates the changes made to the United States Environmental Protection Agency’s (USEPA) Chrome Plating NESHAP amended in September 2012. The NESHAP achieves further hexavalent chromium emission reductions by requiring more stringent emission limits for all facilities. In addition to emission limit reductions, housekeeping measures have also been made more stringent. For facilities that utilize chemical fume suppressants, surface tension limits have been lowered. Under Title 42 of the United States Code (U.S.C.), Section 7416, SCAQMD has the authority to either enforce equally effective or more stringent regulations than the NESHAP. Under Health and Safety Code (H&SC) Section 39666(d), SCAQMD has the authority to either enforce equally effective or more stringent regulations than the NESHAP or the state ATCM.

**Public Process**

PAR 1469 is being developed through a public process. A working group has been formed to provide the public and stakeholders an opportunity to discuss important details about the proposed amendment to the rule and provide SCAQMD staff with important input during the
rule development process. The working group and interested parties are comprised of a variety of stakeholders including representatives from industry, consultants, environmental groups, community groups, and public agency representatives. SCAQMD has held 7 working group meetings on March 23, 2017, May 18, 2017, June 29, 2017, August 2, 2017, August 31, 2017, September 20, 2017, and October 26, 2017. An eighth working group meeting is scheduled for November 29, 2017 in the city of Compton. Working group meetings for this rulemaking were well attended with approximately 100 people in attendance per meeting. On average, working group meetings were 3 to 4 hours.

HEXAVALENT CHROMIUM

“Toxic air contaminant” (TAC) is defined as an “air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health” (Health and Safety Code Section 39655(a)). In 1986, the California Air Resources Board (ARB) identified hexavalent chromium as a carcinogenic TAC based on a review of available scientific evidence.

In the South Coast Air Quality Management District (SCAQMD), hexavalent chromium was measured in each of the SCAQMD’s Multiple Air Toxics Exposure Studies (MATES). These studies measured levels of air toxics in mostly residential or commercial areas. While the MATES studies showed that hexavalent chromium levels have decreased over the past couple decades, this air pollutant was still the 7th largest contributor to air toxics cancer risk in the Basin in the most recent MATES study (MATES IV).

Hexavalent chromium may occur as aerosols or particulate matter in the air, which can be inhaled directly or deposited on soil or water, which can then be ingested. Contact with soil containing hexavalent chromium may transfer to the hands and then to the mouth. Young children may put their hands in their mouths more frequently than adults and therefore are more likely to consume contaminated soil. Chromic acid, a form of hexavalent chromium, is created as a mist during electroplating, which can be inhaled. Chromic acid can be absorbed through skin and ingested if deposited on the skin. Exposure to hexavalent chromium can increase the risk of developing certain types of cancer or result in other adverse health effects.

Inhalation of hexavalent chromium can cause both cancer and non-cancer health effects. Inhalation of hexavalent chromium over a long period of time increases the risk of lung cancer and nasal cancer. The non-cancer effects of being exposed to hexavalent chromium at high levels over time can cause or worsen health conditions such as irritation of the nose, throat and lungs; allergic symptoms (wheezing, shortness of breath), and nasal sores and perforation of the membrane separating the nostrils (for example, at very high air levels in workplaces).

CalEPA’s Office of Environmental Health Hazard Assessment (OEHHA) has calculated a cancer risk associated with exposure to hexavalent chromium if a population were to be exposed continuously for 30 years. The continual exposure to 0.045 nanograms per cubic meter (ng/m3) of hexavalent chromium for 30 years would increase cancer risk by 25-in-a-million. Exposure over shorter periods of time would be associated with smaller increases in cancer risk. In MATES IV, the average levels of hexavalent chromium in mostly residential and commercial
areas across the Basin was 0.06 ng/m3. The SCAQMD has measured levels very close to facilities emitting hexavalent chromium, and has found that hexavalent chromium levels near such facilities can be substantially higher than background levels measured in MATES IV.

**REGULATORY HISTORY**

Chrome plating and chromic acid anodizing facilities are subject to local, state, and federal requirements. Rule 1469 incorporates provisions that are equal to or more stringent than the Chrome Plating state ATCM and federal NESHAP.

**USEPA National Emission Standards for Hazardous Air Pollutants: Plating and Polishing Industry (Subpart WWWW)***

In January 1995, USEPA promulgated the NESHAP for Chromium Emissions from Hard and Decorative Chromium Plating and Chromic Anodizing Tanks.

On June 12, 2008, USEPA issued under 40 CFR Part 63 Subpart WWWW, the Plating and Polishing NESHAP for area sources, which addressed national air toxics standards for smaller-emitting sources, known as area sources, in the plating and polishing industry. The requirements apply to existing and new area sources in the plating and polishing rule. The rule affected existing plating and polishing facilities and applies to plating and polishing tanks, dry mechanical polishing operations, and thermal spraying operations that use or emit compounds of one or more of the following metal toxic air pollutants: cadmium, chromium, lead, manganese, and nickel. It includes management practices such as wetting agent/fume suppressants, use of tank covers or control devices, and the capture and control of emissions from thermal spraying and dry mechanical polishing.

In September 2012, USEPA amended the NESHAP for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks. The federal regulation reduced emission limits, decreasing a facility’s mass emissions. Chromium electroplating and chromic acid anodizing which utilize chemical fume suppressants must maintain their electroplating bath to 40 dynes/cm or less. The addition of perfluorooctane sulfonic acid (PFOS) based fume suppressants would be prohibited (see Non-PFOS Chemical Fume Suppressants section under Control Technologies below).

The 2012 NESHAP for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks revised emission limits for total chromium with reductions to the following categories.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Previous Total Chromium Limits</th>
<th>2012 Total Chromium Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Hard Chromium Electroplating</td>
<td>0.015 mg/dscm</td>
<td>0.011 mg/dscm</td>
</tr>
<tr>
<td>Small Hard Chromium Electroplating</td>
<td>0.030 mg/dscm</td>
<td>0.015 mg/dscm</td>
</tr>
<tr>
<td>Decorative Chromium Electroplating</td>
<td>0.010 mg/dscm</td>
<td>0.007 mg/dscm</td>
</tr>
<tr>
<td>Chromium Anodizing</td>
<td>0.010 mg/dscm</td>
<td>0.007 mg/dscm</td>
</tr>
</tbody>
</table>
Housekeeping practices were added in Table 2 under 40 CFR 63.342, which applies to all source categories and are summarized below:

- Store any substance used in an affected chromium or chromium anodizing tank that contains hexavalent chromium in a closed container when transporting or in a closed container in an enclosed storage area.
- Install technology and implement practices to minimize spills of bath solution and reduce drag out when parts are being moved or rinsed from the tank.
- Clean-up spills from an affected chromium electroplating or chromium anodizing tank within 1 hour.
- Clean surfaces regularly.
- Prohibit buffing, grinding, or polishing operations in the same room as anodizing or electroplating unless a physical barrier is in place.
- Store chromium containing wastes generated from housekeeping activities in a manner that does not generate fugitive dust.

Chromium Plating Airborne Toxic Control Measure (ATCM)

In February 1988, CARB adopted the Chromium Plating ATCM to reduce emissions of hexavalent chromium from hard and decorative chromium electroplating and chromic acid anodizing operations. The ATCM required that all hard plating tanks and anodizing tanks be vented to emission collection systems and established best available control technology (BACT) for the equipment. It also established control efficiency limits for add-on air pollution control devices and alternative emission limits based on the annual hexavalent chromium emissions of plating and anodizing shops. More stringent limits were required of larger facilities than those of smaller facilities, with the goal of reducing emissions from plating and anodizing tanks by at least 95 percent.

On May 21, 1998, CARB’s Board approved amendments to the Chrome Plating ATCM to consolidate the requirements from both the state and federal chrome plating regulations. Emission limits for decorative chrome and chromic acid anodizing were replaced with emissions limits from the federal chrome plating regulation. The amendment also expanded the applicability to trivalent chrome operations in addition to the already regulated hexavalent chrome operations. It added performance test requirements, inspection and maintenance requirements, monitoring provisions, recordkeeping and reporting requirements, and requirements for requesting alternative provisions.

On October 24, 2007, CARB amended the ATCM a second time. The amended ATCM provided further hexavalent chromium emission reductions by requiring more stringent emission limits for some facilities, and ensured that construction of new facilities are not sited near sensitive receptors. Generally, except for small facilities, the limits required the installation or upgrade of add-on air pollution control devices at plating tanks. The amendment required the use of HEPA filters—which were found to reduce emissions by over 99.9 percent—or the use of controls that resulted in equivalent emissions reductions, at many facilities. In addition to emission limit changes, the ATCM also added housekeeping measures.
SCAQMD Rules
Rule 1469 – Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations is the primary air toxics rule that affects chromium electroplating and chromic acid anodizing operations. In addition to Rule 1469, Rule 1402 - Control of Toxic Air Contaminants from Existing Sources also apply to Rule 1469 facilities as discussed below.

Rule 1469 – Hexavalent Chromium
In January 1986, CARB identified hexavalent chromium as a toxic air contaminant in accordance with H&SC Sections 39650, et seq. Rule 1169 – Hexavalent Chromium – Chrome Plating and Chromic Acid Anodizing is one of the first source-specific toxic rules and was adopted on June 3, 1988 to reduce hexavalent chromium emissions from chromium electroplating (hard and decorative) and chromic acid anodizing processes. SCAQMD amended Rule 1169 in September 1989 and in December 1990.

On October 9, 1998, SCAQMD adopted Rule 1469 - Hexavalent Chromium Emissions from Chromium Electroplating and Chromic Acid Anodizing Operations and repealed Rule 1169. The 1998 adoption of Rule 1469 combined the requirements of Rule 1169 and the Chrome Plating state ATCM and federal NESHAP. Under California H&SC Section 39666, air districts have the option of either directly enforcing the ATCM without adopting a regulation, or adopting an equally effective or more stringent regulation. Rule 1469 also included additional monitoring, recordkeeping, and reporting requirements, and additional emission standards that in some cases are more stringent than existing requirements for hard and decorative chrome plating operations, and additional requirements for trivalent chrome plating operations, which were already widely used in practice by the chrome plating industry.

On May 2, 2003, Rule 1469 was amended through a participatory rulemaking process. The process included industry representatives, environmental and community groups, staff from SCAQMD and other agencies, technical experts, representatives from the Small Business Alliance and the Ethnic Community Advisory Group, a facilitator, and an independent observer. The proposed amendments set general requirements for all facilities and more stringent requirements for facilities for which the nearest residence or sensitive receptor is within 25 meters or for which the nearest school is within 100 meters. Facilities were required to meet an ampere-hour threshold that is based on a calculated cancer risk of 10 in a million, or install controls. In general, facilities were required to meet an emission limitations based on ampere-hour thresholds or demonstrate risk directly through an emissions inventory and health risk assessment. The 2003 amendments required installation of ampere-hour meters on plating and anodizing tanks, use of certified fume suppressants, housekeeping practices, operating training and certification, and emission limits based on the distance to the nearest residence or sensitive receptor.

On December 5, 2008, Rule 1469 was amended to be consistent with the recently amended Chrome Plating ATCM. The amendment further reduced hexavalent chromium emissions by setting lower emission limits for some operators and establishing more stringent housekeeping requirements. Additional provisions beyond the ATCM were also incorporated such as more detailed housekeeping requirements and enhanced monitoring, recordkeeping for waste materials
and testing of add-on air pollution control devices. These requirements were intended to ensure compliance and minimize drag-out emissions during chromium electroplating and chromic acid anodizing operations.

**Rule 1402 - Control of Toxic Air Contaminants from Existing Sources**

Rule 1402 – Control of Toxic Air Contaminants from Existing Sources was adopted by the SCAQMD Governing Board in 1994 and last amended in 2016. The objective of Rule 1402 is to minimize health risks from TACs. This rule applies to existing facilities within SCAQMD’s jurisdiction whose facility-wide toxic air contaminant emissions exceed specific risk levels. Rule 1402 is designed to implement the AB2588 Hot Spots program, which is a statewide program that collects emissions data of TACs, identifies facilities having localized impacts, determines health risks, and notifies affected individuals. Individual facilities determined to emit high levels of TACs must submit a Health Risk Assessment to assess the health risks to their surrounding communities. AB2588 also allows for air districts to designate “industry-wide source” facilities, where compliance may be handled collectively, rather than individual compliance that would impose severe economic hardships. SCAQMD has identified metal plating and finishing facilities as an industry-wide source.

Although Rule 1469 facilities are in general identified as industry-wide sources under AB2588, there are approximately 24 Rule 1469 facilities that are in the core AB2588 program. Facilities that in the core AB2588 program are generally larger chromium plating or anodizing facilities and are required to report toxic emissions annually and provide a more detailed toxics emissions inventory every fourth year. The AB2588 emissions reporting covers Rule 1469 equipment as well as other toxic emitting sources that are not covered under Rule 1469 such as chromium spraying operations and nickel and cadmium plating operations and any other toxic emitting processes or equipment. During this “quadrennial” toxics emissions reporting, SCAQMD staff conducts a prioritization screening. If the prioritization screening is over 10, the facility is required to submit an Air Toxics Inventory Report and Health Risk Assessment under Rule 1402. Under Rule 1402, if the cancer health risk is above the action risk level (25 in a million), the facility must submit and implement a Risk Reduction Plan. The health risk assessment is based upon emissions from all processes at the facility, in addition to Rule 1469 sources.

In October 2016, Rule 1402 was amended to add provisions for Potentially High Risk Level Facilities where SCAQMD has evidence that the facility is contributing to a significant health risk – cancer risk greater than 100 in-a-million. Rule 1402 sets hexavalent chromium reporting thresholds for the Metal Finishing industry at 0.002 lbs/yr which once exceeded, requires a facility to submit a total facility toxic emissions inventory to SCAQMD. In addition, state law (H&SC Section 44391) requires any facility with significant risk (100 in a million cancer risk or a chronic hazard index of 5.0 for Rule 1402) to reduce risk.

**2015 OEHHA Guidelines**

On March 6, 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) approved revisions to their Risk Assessment Guidelines (2015 OEHHA Guidelines). The 2015 OEHHA Guidelines were triggered by the passage of the Children’s Health Protection Act of 1999 (SB 25, Escutia) requiring OEHHA to ensure infants and children are explicitly addressed
in assessing risk. Over the past decade, advances in science have shown that early-life exposures to air toxics contribute to an increased estimated lifetime risk of developing cancer, or other adverse health effects, compared to exposures that occur in adulthood. The new risk assessment methodology addresses this greater sensitivity and incorporates the most recent data on infants and childhood and adult exposure to air toxics. The 2015 OEHHA Guidelines incorporate age sensitivity factors and other changes which will increase estimated cancer risk estimates to residential and sensitive receptors, based on the change in methodology, by approximately 3 times, and more than 3 times for toxic air contaminant such as hexavalent chromium which has multiple pathways of exposure in addition to inhalation. Health risks for off-site worker receptors are similar between the existing and revised methodology because the methodology for adulthood exposures remains relatively unchanged. Even though there may be no increase in toxic emissions at a facility, the estimated cancer risk using the 2015 OEHHA Guidelines is expected to increase.

**European Union’s European Chemicals Agency**

On April 17, 2013, the European Union’s (EU’s) regulatory authority that implements legislation on chemical safety—the European Chemicals Agency (ECHA)—placed several of the most common forms of hexavalent chromium on its “Authorisation List,” citing them as carcinogenic and mutagenic, and classifying them as “substances of very high concern.” The compounds that ECHA singled out are chromium trioxide, acids generated from chromium trioxide, sodium dichromate, potassium dichromate, ammonium dichromate, potassium chromate, and sodium chromate. Several of these compounds are used extensively in the chrome electroplating and anodizing processes.

After an established sunset date, chemicals that are placed on the Authorisation List are prohibited from use in, and importation into the EU, unless companies that produce or use them submit applications to exempt them for specific uses. If an application is approved by ECHA, the chemical will continue to be permitted for those uses. The sunset date for the hexavalent chromium compounds was September 21, 2017. SCAQMD staff is continuing to research the ECHA’s regulation and if there are similar provisions that can be implemented in PAR 1469 to minimize use of hexavalent chromium.

**AMBIENT MONITORING NEAR CHROMIC ACID ANODIZING FACILITIES**

SCAQMD staff conducted ambient monitoring of hexavalent chromium near five chromic acid anodizing facilities. One facility in the city of Newport Beach, a facility in the city of Paramount, a facility in Long Beach, and two facilities in Compton. Hexavalent chromium levels were elevated near the Newport Beach, Paramount, and Long Beach facilities. Based on the 10 monitoring sites in SCAQMD’s MATES IV study, average hexavalent chromium levels are approximately 0.06 ng/m³. None of the monitors are near Rule 1469 facilities and are generally sited in both residential and commercial areas throughout the South Coast Air Basin (Basin). The MATES IV study can be found here: [http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv](http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv).
Levels near the facility in Newport Beach, as measured by monitors north and south of the facility, were averaging 0.4 ng/m$^3$ in 2009 (as measured by the north monitor), and rose to over 3.5 ng/m$^3$ in 2013. The facility began implementing changes to their operational procedures and by the end of 2016 installed and operated control equipment to minimize emissions; the average annual concentration dropped steadily from 2013 to 2016. Average concentration levels were below 0.2 ng/m$^3$ in 2016. Average emissions in 2017 saw a slight rise to below 0.4 ng/m$^3$. The increase in emissions in the year, including the more dramatic increase seen in July of 2017, may be attributed to construction work where concrete was being broken up, and the rubble was being removed from the facility.

**Figure 1-1: Annual Average Hexavalent Chromium Levels at Newport Beach Facility**

Levels near the Paramount facility were initially near 11 ng/m$^3$ when monitoring began in the latter part of 2016, and they currently average below 0.25 ng/m$^3$. Levels near the Long Beach facility were initially near 0.9 ng/m$^3$ when monitoring began in May 2017, and they currently average below 0.4 ng/m$^3$. These facilities had various types of equipment subject to SCAQMD rules and regulations and permit requirements. Some of the potential onsite sources of emissions include the chrome anodizing line, nickel and cadmium plating, curing and drying ovens, paint spray booths, abrasive blasting equipment, waste water treatment system, and miscellaneous natural gas combustion sources. In addition, equipment such as, tanks, racks, and drums and operations such as packaging, product transfer, and maintenance and cleaning activities may have the potential to contribute to fugitive emissions. Information on ambient air monitoring in the
communities can be found here:  http://www.aqmd.gov/home/library/clean-air-plans/air-toxics-action-plan.

AFFECTED RULE 1469 FACILITIES
PAR 1469 will affect chromium electroplating or chromic acid anodizing facilities. Based on SCAQMD permitted data, internet searches, industry provided lists of potential facilities, SCAQMD staff has identified 117 facilities that either conduct decorative or hard chromium electroplating or chromic acid anodizing operations within SCAQMD’s jurisdiction. Of the 117 affected facilities, 49 facilities conduct decorative hexavalent chromium plating, 31 facilities conduct hard hexavalent chromium plating, and 30 facilities conduct chromic acid anodizing. The majority of the plating facilities conduct hexavalent chromium plating with only 4 facilities that conduct trivalent chromium plating only. There are 3 facilities that conduct both chromic acid anodizing and hard hexavalent chromium plating. The facilities are categorized under SIC code 3471: Electroplating, Plating, Polishing, Anodizing, and Coloring. This universe of facilities and tanks were obtained via SCAQMD’s equipment permitting database and staff-conducted surveys of facilities.

The majority of chromium electroplating and chromic acid anodizing facilities are considered job shops, which typically perform a wide range of metal finishing services in addition to chromium electroplating (i.e. nickel plating, copper plating) and offer these services for contract. Job shops are independent operators that serve a variety of industries. The most common electroplating processes in job shops include nickel, copper, zinc and chromium. The automotive, computer/electronics, machinery/industrial equipment and defense/government are the four largest segments of industry served by all electroplaters and anodizers. In addition, fasteners are a large industry segment for job shops.

Different from job shops are captive shops located in industries where chromium electroplating is used as a secondary process to aid in production. Captive shops are found within companies that manufacture products rather than specialize in metal plating. In captive shops, the most common processes include nickel, chromium and zinc electroplating and anodizing. Captive shops typically have a higher degree of automation, due to their more predictable finishing requirements.

PROCESS DESCRIPTION
Chromium electroplating and chromic acid anodizing are electrolytic processes, where parts and substrates are submerged in a bath containing chromic anhydride (CrO3), commonly called chromic acid. Many of the Rule 1469 facilities have other plating tanks using metals such as nickel and cadmium. Those tanks are covered under a separate rule, Rule 1426.

Hard Chromium Electroplating
Hard chromium electroplating involves depositing a “thick” layer of chromium (measured in thousandths of an inch) on a part, imparting corrosion protection, wear resistance, lubricity and oil retention among other properties. Examples of parts, which are hard chromium electroplated, include engine parts, industrial machinery and tools. It is nearly always applied to parts made of
steel. Because of the thickness of the electroplating layer, electroplating duration is measured in hours or days.

**Decorative Chromium Electroplating**
Decorative chromium electroplating involves depositing a thin layer of chromium (measured in millionths of an inch), which gives a decorative and protective finish. Examples of parts which are decorative chromium electroplated include furniture components, bathroom fixtures, car bumpers and wheels. Electroplating duration is measured in seconds or minutes.

**Chromic Acid Anodizing**
Chromic acid anodizing involves electrolytic oxidation of a surface to produce a wear and corrosion resistant surface, without depositing a metallic chromium layer. Anodizing is an electrochemical process during which aluminum is the anode. When an electric current passes through the electrolyte, it converts the metal surface to a durable aluminum oxide. The difference between electroplating and anodizing is that the oxide coating is integral with the metal substrate as opposed to being a metallic coating deposition. The oxidized surface is hard and abrasion resistant, and it provides some degree of corrosion resistance.

**Electrolytic Tanks**
During the electroplating process hydrogen gas forms very small bubbles, which have high misting potential. The gas bubbles entrain chromic acid and form chromic acid mist at the surface of the electroplating bath. A similar process occurs as oxygen bubbles break the surface of the electroplating bath. The magnitude of emissions depends on several electroplating variables, including the concentration of chromic acid in the bath, ampere-hours used during electroplating, bath temperature, bath purity, and surface tension. Bubble formation due to electrolysis is the primary mechanism by which hexavalent chromium emissions are generated (chemical fume suppressants, discussed at greater length in the Control Technologies Section below, are added to electrolytic tanks to prevent and control bubble formation).

**Non-Electroplating or Non-Anodizing Tanks**
Chromium electroplating and chromic acid anodizing facilities may have multiple tanks that are in the process line. The tanks either prepare or finish parts that will be anodized or electroplated, but are not considered anodizing or electroplating tanks themselves. Some of these have been identified as hexavalent chromium-containing tanks. The tanks contain hexavalent chromium as a by-product of the operation, intentional or unintentional contamination from the previous tank, or hexavalent chromium is a constituent of the tank. Hexavalent chromium-containing tanks may be heated, air sparged, or rectified. Heated tanks can cause the tanks to reach temperatures that generate bubbles. The gas bubbles contain hexavalent chromium and rupture at the surface generating hexavalent chromium emissions. Heated tanks can also cause solutions to vaporize creating hexavalent chromium emissions. Air sparging is the process of agitating the tank bath to create a heterogeneous mixture. The tank is aerated and bubbles are generated and as a result release hexavalent chromium emissions when it reaches the surface. SCAQMD staff identified several tank operations that can be sources of hexavalent chromium emissions, which are discussed below:
• **Drag-Out/Rinse Tanks**
  Following the anodizing or electroplating of a part, the part can be placed in a drag-out/rinse tank. This tank collects liquid from the previous tank and rinses the part. The drag-out tank is a rinse tank initially filled with pure water. Air agitation is often used to aid the rinsing process because there is no water flow in the tank to cause turbulence. The rinse tanks may also be heated, depending upon the operation. As the plating line is operated, the drag-out/rinse tank remains stagnant and its chemical concentration and the amount of metals in the tank increases as more work is processed. The liquid can remain in the tank or be processed.

• **Seal Tanks**
  Sealing closes the porous surface generated during the anodizing process, which gives the product maximum corrosion resistance, but minimizes the wear resistance of the anodized oxide layer. The anodized part is immersed in either hot water, nickel acetate, or dichromate seal. The seal tanks are heated to near boiling temperatures.

• **Passivation Tanks**
  Passivation is a chemical process designed to increase the corrosion resistance of parts. Parts are placed in the tank solution and submerged in a nitric acid bath. A hard non-reactive surface film that inhibits further corrosion forms on the surface. Sodium dichromate can be a constituent in the tank.

• **Stripping Tanks**
  Parts may have an existing layer of chrome coating on them that must be stripped prior to plating. The stripping process may either use a chemical process or use an electrical current to remove the layer. The concentration of hexavalent chromium in stripping tanks can vary by facility. These tanks are often electrolytic as well.

• **Chromate Conversion Tanks**
  Chromate conversion tanks are also referred to as “chem film” tanks. The conversion process converts the surface properties of the substrate by applying a thin protective coating utilizing bath chemistry rather than an electrolytic process.

**Rinse Process**

**Counter-flow Rinsing**
Counter-flow rinsing is the process of utilizing multiple rinse tanks connected in series. Fresh water flows into the rinse tank located furthest from the process tank and overflows, in turn, to the rinse tanks closer to the process tank. This technique is counter-flow rinsing because the work piece and the rinse water move in opposite directions. Over time, the first rinse becomes contaminated with drag-out. The second rinse tank is at an even lower concentration. The more counter-flow rinse tanks, the lower the water flow needed for adequate removal of the process solution.

**Spray Rinsing**
Spray rinsing is the use of spray nozzles to rinse parts over process tanks or in a tank. Spray rinsing can significantly decrease drag-out, however, too high a water pressure can cause water that is laden with hexavalent chromium to ricochet off the parts. Some facilities use a variety of techniques to contain the hexavalent chromium laden water spray by spray rinsing in a tank or using containment barriers around the spraying operation.
Waste Processing
During hexavalent chromium electroplating or chromic acid anodizing, some portion of the materials used in production is not totally captured as product and can exit the process in wastewater and solid waste. Solids in the plating solution are precipitated out with the addition of chemicals. Further, a multi-stage clarifying system can be used so that a large portion can settle to the bottom as sludge. The sludge is a very wet metal hydroxide mixture that is removed from the treatment tank and can be “dewatered” in filter presses, leaving a wet mud that is generally 25 percent solids by weight. The sludge can be further dried to further reduce moisture content and weight by using a heated dryer. The sludge is stored in containers, such as, “super sacks,” or larger “roll off boxes,” and sent to facilities that are permitted to process hazardous waste.

A difference between hexavalent chromium facilities and other metal plating facilities is the practice to reduce hexavalent chromium to trivalent chromium. This process is conducted prior to precipitation of solids. A reducing agent, such as sodium bisulfite, is added and reduces hexavalent chromium to trivalent chromium. The hexavalent chromium to trivalent chromium reduction reaction is not 100%. Hexavalent chromium electroplating and chromic acid anodizing facilities identify the sludge as regulated solid waste F006 and F007 under 40 CFR 261.31.

SCAQMD SAMPLING
To better identify the potential sources of the elevated levels of hexavalent chromium, SCAQMD staff conducted hexavalent chromium emission sampling for various tanks that could potentially be sources of hexavalent chromium emissions. The following tables summarize the results.
Table 1-1: SCAQMD Sample Results of Sealing Tanks

<table>
<thead>
<tr>
<th>Tank Type</th>
<th>Facility</th>
<th>Hexavalent Chromium Content (ppm)</th>
<th>Tank Operating Temperature (°F)</th>
<th>Air Sparging</th>
<th>Surface Area (ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Dichromate</td>
<td>Facility B</td>
<td>80,400</td>
<td>200</td>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td>Sodium Dichromate</td>
<td>Facility C</td>
<td>Not Recorded</td>
<td>Not Measured</td>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td>Sodium Dichromate</td>
<td>Facility E</td>
<td>53,000²</td>
<td>203</td>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td>Sodium Dichromate</td>
<td>Facility D</td>
<td>32,000</td>
<td>194-212</td>
<td>No</td>
<td>32</td>
</tr>
<tr>
<td>Sodium Dichromate</td>
<td>Facility B</td>
<td>24,200</td>
<td>200</td>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td>Sodium Dichromate</td>
<td>Facility A</td>
<td>17,000</td>
<td>196</td>
<td>Yes</td>
<td>30</td>
</tr>
<tr>
<td>Dilute Chromate</td>
<td>Facility A</td>
<td>100</td>
<td>203</td>
<td>Not Recorded</td>
<td>30</td>
</tr>
<tr>
<td>Teflon</td>
<td>Facility C</td>
<td>5</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>4.5</td>
</tr>
<tr>
<td>Hot Deionized (DI) Water</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Heated (assumed)</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Nickel Acetate</td>
<td>Facility B</td>
<td>&lt;1</td>
<td>Heated</td>
<td>Not Recorded</td>
<td>12</td>
</tr>
<tr>
<td>Nickel Acetate</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>11</td>
</tr>
<tr>
<td>Nickel Acetate</td>
<td>Facility A</td>
<td>&lt;1</td>
<td>170</td>
<td>No</td>
<td>30</td>
</tr>
<tr>
<td>Nickel Acetate</td>
<td>Facility F</td>
<td>ND⁴</td>
<td>Heated</td>
<td>Not Recorded</td>
<td>8</td>
</tr>
</tbody>
</table>

¹ Dow #7 (Type III) – used in magnesium anodizing process lines
² Highest value taken of a triplicate run
³ Hexavalent chromium air concentration measurement
⁴ Not Detectable
### Table 1-2: SCAQMD Sample Results of Chromate Conversion and Dye Tanks

<table>
<thead>
<tr>
<th>Tank Type</th>
<th>Facility</th>
<th>Hexavalent Chromium Content (ppm)</th>
<th>Tank Operating Temperature (°F)</th>
<th>Air Sparging</th>
<th>Surface Area (ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem Film</td>
<td>Facility G</td>
<td>2880</td>
<td>Ambient</td>
<td>No</td>
<td>3.75</td>
</tr>
<tr>
<td>Chem Film</td>
<td>Facility C</td>
<td>4</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Chromate Film</td>
<td>Facility D¹</td>
<td>Not Measured</td>
<td>Ambient</td>
<td>Yes</td>
<td>32</td>
</tr>
<tr>
<td>Alodine Clear</td>
<td>Facility F</td>
<td>300</td>
<td>Ambient</td>
<td>Not Recorded</td>
<td>8</td>
</tr>
<tr>
<td>Gold Dye</td>
<td>Facility C</td>
<td>8</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Blue Dye</td>
<td>Facility C</td>
<td>2</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Black Dye</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Red Dye</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Green Dye</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Heated Dye</td>
<td>Facility F</td>
<td>ND²</td>
<td>Heated</td>
<td>Not Recorded</td>
<td>8</td>
</tr>
</tbody>
</table>

¹ Hexavalent chromium air concentration measurement
² Not Detectable
### Table 1-3: SCAQMD Sample Results of Rinse, Cleaner, and Desmutt Tanks

<table>
<thead>
<tr>
<th>Tank Type</th>
<th>Facility</th>
<th>Hexavalent Chromium Content (ppm)</th>
<th>Tank Operating Temperature (°F)</th>
<th>Air Sparging</th>
<th>Electrolytic</th>
<th>Surface Area (ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rinse</td>
<td>Facility G</td>
<td>23,200</td>
<td>Heated</td>
<td>No</td>
<td>No</td>
<td>24</td>
</tr>
<tr>
<td>Rinse</td>
<td>Facility C</td>
<td>4</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Rinse</td>
<td>Facility D</td>
<td>2</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Rinse</td>
<td>Facility F</td>
<td>&lt;1</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Rinse</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>DI Rinse</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Heated</td>
<td>Not Recorded</td>
<td>No</td>
<td>8</td>
</tr>
<tr>
<td>DI Rinse</td>
<td>Facility C</td>
<td>2,300</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>DI Rinse</td>
<td>Facility C</td>
<td>19</td>
<td>Not Measured</td>
<td>Yes</td>
<td>No</td>
<td>9</td>
</tr>
<tr>
<td>Cleaner</td>
<td>Facility C</td>
<td>10</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>29</td>
</tr>
<tr>
<td>Cleaner</td>
<td>Facility H</td>
<td>6</td>
<td>Heated</td>
<td>Not Specified</td>
<td>Yes</td>
<td>24</td>
</tr>
<tr>
<td>Desmutt</td>
<td>Facility C</td>
<td>0</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>3</td>
</tr>
</tbody>
</table>
### Table 1-4: SCAQMD Sample Results of Passivation, Etch, Neutralizer, and Stripping Tanks

<table>
<thead>
<tr>
<th>Tank Type</th>
<th>Facility</th>
<th>Hexavalent Chromium Content (ppm)</th>
<th>Tank Operating Temperature (°F)</th>
<th>Air Sparging</th>
<th>Electrolytic</th>
<th>Surface Area (ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chrome Stripping</td>
<td>Facility I</td>
<td>47,400</td>
<td>Not Measured</td>
<td>No</td>
<td>Yes</td>
<td>64</td>
</tr>
<tr>
<td>Chrome Stripping</td>
<td>Facility I</td>
<td>37,000</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Yes</td>
<td>42</td>
</tr>
<tr>
<td>Chrome Stripping</td>
<td>Facility M</td>
<td>2,300</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Yes</td>
<td>7.5</td>
</tr>
<tr>
<td>Passivate</td>
<td>Facility F</td>
<td>10,100</td>
<td>Heated</td>
<td>No</td>
<td>No</td>
<td>8</td>
</tr>
<tr>
<td>Passivate</td>
<td>Facility L</td>
<td>7,200</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>Not Recorded</td>
</tr>
<tr>
<td>Passivate</td>
<td>Facility L</td>
<td>ND&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>No</td>
<td>Not recorded</td>
</tr>
<tr>
<td>Passivate Rinse</td>
<td>Facility G</td>
<td>210</td>
<td>Not Measured</td>
<td>Yes</td>
<td>No</td>
<td>9</td>
</tr>
<tr>
<td>Etch Tank</td>
<td>Facility C</td>
<td>9</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
<td>29</td>
</tr>
<tr>
<td>Acid Neutralizer</td>
<td>Facility C</td>
<td>&lt;1</td>
<td>Not Measured</td>
<td>Not Recorded</td>
<td>Not Recorded</td>
<td>6</td>
</tr>
</tbody>
</table>

<sup>1</sup> Not Detectable

Emissions are a greater concern for those tanks that are heated, air sparged or electrolytic as explained earlier in this chapter. High concentrations of hexavalent chromium were found in sodium dichromate seal tanks, chrome stripping tanks, passivation tanks, and some rinse tanks. Depending on the design of the facility, rinse waters can have a large variability of hexavalent chromium concentrations. Another factor that contributes to the hexavalent chromium concentration is the frequency of rinse water change out for the respective tank. Chem film tanks, dye tanks, and most tanks used in the cleaning process (i.e. several rinse tanks, and cleaner and desmutt tanks) were generally found to have low hexavalent chromium concentrations. Chromate conversion and dye operations are chemical process that have specific concentrations of hexavalent chromium that are dependent on the required specifications of the bath. Sampling results showed a large variation of hexavalent chromium between various “chem films”, but typically a low concentration of hexavalent chromium in dye operations.

### SUMMARY OF SOURCE TEST RESULTS FOR PLATING AND ANODIZING TANKS

Rule 1469 requires owners or operators to comply with emission rate standards that are demonstrated to be achieved through either in-tank controls, add-on controls, or a combination of
methods. Facilities required to achieve the 0.01 mg/amp-hr emission rate may use a certified chemical fume suppressant, which has been certified to meet the emission rate at specific surface tension. Facilities required to achieve a more stringent emission rate must verify the performance of control methods or add-on controls through a source test. Rule 1469 does not require periodic source testing.

**Figure 1-2: Distribution of Most Recent Source Tests**

A majority of facilities conducted a source test more than eight years ago with only four facilities having conducted a source test within the last three years. No source tests were conducted in 2014. Periodic source tests are necessary to confirm that the facility’s control method or add-on controls are providing sufficient capture and control of hexavalent chromium emissions at a specific emission rate. The source tested emission rate is used to determine an appropriate ampere-hour limit during the permitting process. If a facility operates at a higher emission rate than what was permitted, the hexavalent chromium emissions that would be discharged by the facility would be higher than what was expected leading to elevated emissions of hexavalent chromium.

**Slot Velocity Measurements**

Under Rule 1469, add-on air pollution control devices are one method of capturing and controlling hexavalent chromium emissions from electrolytic tanks. Hexavalent chromium emissions are captured via a ventilation system that is dependent on a specified velocity to ensure sufficient capture efficiency. Rule 1469 requires a periodic qualitative assessment of the performance of add-on air pollution control devices by conducting a smoke test. The smoke test verifies that emissions are moving directly towards the collection device and are not meandering around or moving away from the collection device. However, there is no requirement to quantify the slot velocities of the capture system. Recent source tests of add-on air pollution control devices specifies each individual slot velocity at the time of the source test. However, many older tests do not have a listed capture slot velocity. SCAQMD staff was concerned the slot velocity degrades overtime due to lack of maintenance of the ventilation and build-up of material.
in and around the slots leading to the ventilation and the captured amount of hexavalent chromium would be significantly less than 100%.

SCAQMD staff conducted site visits at eight metal finishing facilities and measured the slot velocity of add-on controls using a hot wire anemometer. Generally a minimum slot velocity of 2,000 feet per minute for open tanks and 200 feet per minute for covered tanks is recommended per *Industrial Ventilation Manual 28th Edition*. The measured slot velocities were generally lower than either the source tests (if available) or the corresponding recommended minimum slot velocities.

**Figure 1-3: Slot Velocity Measurements of Emission Collection Systems at Multiple Facilities**

![Bar chart showing slot velocity measurements at multiple facilities](image)

Facility E was found to be conducting monthly inspections of the control equipment by performing periodic cleaning of slots of the collection systems, replacing equipment parts of air pollution systems to optimize operation, and utilizing third-party contractors to conduct periodic smoke tests. Owner or operators at facilities with deficient slot velocities conducted infrequent measurement of slot velocities or no measurement of the slot velocities. Requirements to have an owner or operator of facilities periodically measure slot velocities would serve as an additional method to ensure that hexavalent chromium emissions are being collected and directed to the pollution controls.

**SITE VISITS**

As part of PAR 1469 development, SCAQMD staff conducted site visits at 39 facilities that either conduct chromic acid anodizing or hexavalent chromium electroplating. Beginning in 2015 and continuing to 2017, SCAQMD rules staff performed pre-arranged site visits at these facilities. The site visits focused on housekeeping, emission control methods at electroplating and anodizing tanks, grinding emissions, and how the facility would respond to prohibition of fume suppressants that facilities were utilizing as in-tank controls to prevent hexavalent chromium emissions.
**Housekeeping Observations**

Rule 1469 has specific conditions intended to prevent the generation of fugitive emissions of hexavalent chromium. These fugitive emissions may be generated due to atomization of chromium laden liquid, contamination, or uncontained chromium laden liquid being dried. SCAQMD staff observed the following practices that can lead to fugitive emissions of hexavalent chromium.

**Rinsing of Parts**

Prior to proceeding to the next tank in the process line, chrome laden liquid that is adhering to a part or equipment is removed. The owner or operator may utilize a water spray rinse to remove the chrome laden liquid. SCAQMD staff observed facilities spraying parts above a tank with the rinse water being uncontained. In certain circumstances, a splash guard was utilized to prevent overspray and the splash guard was constructed in a manner that had holes or could be influenced by cross-draft. Also, facilities used high pressure sprays that had water ricocheting off parts potentially spreading hexavalent chromium laden liquid beyond the confines of the splash guard and tank.

**Drag-Out**

When parts are removed from the tank, chrome laden liquid adheres to the part. More liquid can adhere to the part if the part is pulled up quickly creating a situation where liquid is dragged out from the tank. In some situations, the drag-out liquid is not caught nor contained and lands on the floor. In other situations, owners or operators were observed to utilize drip trays between tanks or other methods to prevent chrome laden liquid from landing on the floor.

**Location of Roof Vents**

Roof vents of the building were located above the tank process area. The roof vents functioned as exhaust fans for the building that pulled air from the building into the atmosphere. Depending on the proximity of the tank and the contents and other parameters of the tank such as temperature and mixing technique, emissions from the tank can move through the roof vents out to the atmosphere.

**Flooring Materials That are Difficult to Maintain**

Most facilities used either a metal grate or wood planks around tank processing areas. SCAQMD staff observed at one facility, however, that the flooring was constructed out of carpet that could trap chrome laden liquid. This carpet material would be difficult to clean and would be a potential source of fugitive hexavalent chromium emissions if disturbed.

**Waste Processing Area**

Some chromium electroplating or anodizing facilities process waste generated from the tank process. This involves treating metals such as reducing hexavalent chromium into trivalent chromium. Suspended solids get separated out from solutions and can be processed in a filter press. The processed solids are known as sludge and treated as waste. SCAQMD staff observed process sludge in open containers and dust was observed in the waste processing area.
NEED FOR PROPOSED AMENDMENTS TO RULE 1469

As previously discussed, ambient monitoring and sampling at a metal finishing facility in Newport Beach, Paramount, and Long Beach have shown elevated levels of hexavalent chromium that were attributed to cross-drafts that allowed hexavalent chromium emissions to flow outside of the building enclosure and hexavalent chromium emitting tanks that are currently not regulated under Rule 1469. Hexavalent chromium emissions were substantially reduced after operators closed building openings that allowed emissions to flow out of the building, demonstrating the need for certain operating parameters for building enclosures. In addition, emissions testing has shown that certain tanks, such as heated sodium dichromate seal tanks, that are currently not regulated under Rule 1469 can be a significant source of hexavalent chromium emissions that can impact off-site receptors demonstrating the need for pollution controls for these tanks and other tanks with similar operating characteristics.

Proposed Amended Rule 1469 is needed to address issues found during ambient monitoring and emissions sampling and testing at Rule 1469 facilities in Newport Beach, Paramount, and Long Beach. The emissions issues identified at these facilities are not unique to these facilities’ operations, but are occurring at other Rule 1469 facilities with similar tanks and tanks with similar operating characteristics such as tanks with high concentrations of hexavalent chromium, elevated temperature, air sparging, or that were rectified. Based on site visits, building cross-drafts currently occur at many Rule 1469 facilities. PAR 1469 is needed to establish requirements that will minimize the release of fugitive hexavalent chromium emissions from buildings. It establishes requirements to eliminate building cross-drafts, while still allowing for building ventilation. Fans and vents vented to the open air that are located directly over uncontrolled hexavalent chromium emitting tanks were additional issues identified during site visits.

In addition to issues identified through monitoring and sampling, staff identified other Rule 1469 amendments that are needed to minimize fugitive hexavalent chromium emissions. Provisions are needed to ensure ongoing compliance with emission limitation requirements. Currently Rule 1469 requires a one-time source test of pollution control equipment to confirm compliance with the emission limit. Amended source testing provisions ensure that the pollution controls are operating properly and identify any degradation of the efficacy of the pollution controls that may occur over time. Provisions are also needed to ensure that pollution controls are operating on a continuous basis. PAR 1469 will incorporate provisions to conduct parameter monitoring such as slot velocities measurements on an ongoing basis to ensure ventilation to the pollution controls is operating properly on a continual basis.

Proposed Amended Rule 1469 is needed to establish basic best management practices. These relatively low-cost practices will help minimize fugitive hexavalent chromium emissions through the use of tank covers, reduction of overspray of hexavalent chromium laden liquid, and reduction of drag-out from parts. Amendments to Rule 1469 are also needed to ensure Rule 1469 is equally as stringent as the recent changes to the federal NESHAP.
Overview of Proposed Amended Rule 1469
PAR 1469 seeks to regulate all tanks in hexavalent chromium electroplating and anodizing operations with hexavalent chromium concentrations of 1,000 ppm or greater. The proposed rule will create two tiers of tanks:

- A Tier I hexavalent chromium-containing tank means a tank permitted to contain a hexavalent chromium concentration of 1,000 ppm or greater
- A Tier II hexavalent chromium-containing tank means a Tier I hexavalent chromium-containing tank that meets any one of the following:
  - An operating temperature above 140 Degrees Fahrenheit; or
  - Uses air sparging as an agitation method; or
  - Is electrolytic.

Both Tier I and Tier II tanks will be required to be operated in a building enclosure, and comply with housekeeping requirements and best management practices to minimize fugitive chrome emissions. Additionally, Tier II tanks, which have been found to have higher emissions, will be required to be vented to add-on air pollution control devices. Hexavalent chromium-containing tanks that are air sparged or are electrolytic are well-known to have chrome emissions, as discussed above in the Process Description section. Additionally, SCAQMD’s emission sampling found that chromium-containing tanks that operate at and above 170 °F have significantly higher emissions than tanks operating at or below 140 °F. Further testing will be conducted to determine whether there are significant increases in emissions in the range of temperatures between 140 and 170 degrees.

Other proposed rule changes include:

- Hexavalent chromium-containing tanks must operate in a building;
- More stringent housekeeping practices for all facilities;
- Revise existing housekeeping requirements;
- Increased monitoring and recordkeeping;
- Prescriptive requirements to reduce cross-draft in plating areas; and
- Removal of interim Rule 1469 conditions that are no longer applicable.

Amendments to PAR 1469 are also needed to address recent revisions to the federal NESHAP. The NESHAP incorporates a lower surface tension limit for chemical fume suppressants limit of 40 dynes/cm when using a stalagmometer, or 33 dynes/cm when using a tensiometer and bans the use of Perfluorooctane Sulfonate in chemical fume suppressants. Most of the other provisions of the NESHAP are already incorporated into the existing Rule 1469. SCAQMD staff has determined that several elements of current Rule 1469 as it stands are equivalent or more stringent than the newly amended NESHAP. Adopting the NESHAP by reference would not result in either an equally effective or more stringent regulation than the current Rule 1469. Therefore, PAR 1469 proposes incorporating elements of the newly amended federal NESHAP into Rule 1469, along with the addition of several new or more stringent requirements that address fugitive emissions and control recently identified point sources. Rule 1469 is also being amended to provide clarity.
CONTROL TECHNOLOGIES
Several types of controls are available for metal electroplating processes and are currently used for reducing emissions from electroplating operations. They are described below.

High-Efficiency Particulate Arrestors (HEPA)
Used in conjunction with a pre-filter, high-efficiency particulate air (HEPA) filters can trap toxic particles as small as 0.3 µm at an efficiency of 99.97 percent or greater. Like cartridge filters, HEPA filter elements are of pleated construction. HEPA filters are generally limited to ambient temperature (up to 100°F), though special applications for higher temperatures are available. Unlike bags or cartridge filters, HEPA filters are not automatically cleaned. When a HEPA filter element becomes loaded with particulate matter, the filter is replaced and disposed of as hazardous waste.

Emission Elimination Device (EED)
An Emission Elimination Device (EED) encloses a process tank while chrome plating is being conducted. The EED incorporates a membrane that allows for free passage of gasses, while effectively blocking the escape of water vapor and chemical mist. The EED is a stand-alone, self-contained unit requiring no supplementary equipment or exhaust to outside the facility. Control efficiency is reported to be 100 percent.

Gases generated during the chromium electroplating process escape through the membrane on the EED. Water vapor condenses on the inside walls and top of the enclosure. The condensate runs back into the plating solution. Chromium mist, being heaviest of all by-products and because of the absence of any significant air movement, rises to a limited height and then also falls back into the plating solution. The denser mist, caused by the presence of water vapor mist, further reduces upward mobility of the chromium mist particles. In addition, the water vapor mist and droplets of condensed water provide scrubbing of the air inside the EED.

An adapter is affixed to the top of the plating tank walls with appropriately placed and properly sealed openings for buss bar, plumbing, and electrical conduits, etc. A hinged hood, with counter weights or other mechanical means of openings, is then placed on top of the adapter. A deformable sealing gasket material (compatible with process chemicals) is placed between the tank wall and adapter as well as between the hood and the adapter. An evacuation process is also incorporated into the system as a means of removing any mists or fumes that remain under the hood after the plating process is completed.

Parts to be plated are placed on the buss bars. The contacts must be cleaned and secured to avoid any sparking during plating. After the cover is closed and secured, the rectifier is turned on and the interlocks automatically engage to secure the access door. Interlocks ensure that the door is not opened while plating is being conducted in the tank. When the rectifier is turned off, the evacuation unit automatically turns on and the evacuation unit must be run for its specified period.
Mist Suppression at Tank Surface
Applicable to electroplating and anodizing, mist suppression at the surface of the electroplating or anodizing tank is a low-cost, zero-energy, first-step method of mitigating heavy metal (including hexavalent chromium) bearing aerosols before they become entrained in ventilation air and put an unnecessary load on downstream control. Mist suppression is accomplished by floating polyethylene balls covering the wet surface of an electroplating or anodizing tank. Tanks remain fully functional with respect to work piece submergence and removal, and the aerosol generation is reduced by 50 to 80 percent. Since aerosols are prevented from leaving the tank surface, there is no waste stream associated with this technology.

Wet Packed-Bed Scrubber
Wet packed-bed scrubbers consist of a vertical column made of fiberglass or other non-corrosive material loosely filled with specially shaped plastic packing material which maximizes gas-to-liquid contact and minimizes pressure drop across the column. Exhaust air from an electroplating or anodizing tank line enters at the bottom of the scrubber and exits at the top. The scrubbing solution is pumped from a reservoir at the base of the scrubber and sprayed down into the packing from the top. This flow scheme is called counter-current scrubbing and is the dominant method in use today due to its high pollutant removal efficiency, ranging from 90 to 98 percent, depending on residence (contact) time and solution freshness.

Chevron Mist Eliminators
This air pollution control device is available in different functional designs, the most common being a chevron-shaped baffle pattern which forces mist-laden air to make several abrupt changes in direction between the entry and exit points of the baffle material. Since mist droplets are much heavier than air molecules, they have too much linear momentum to make sharp turns without impacting the baffles. Since many mist droplets strike the baffles, a liquid film forms causing large droplets to coalesce and drop back down into the piece of equipment being controlled. Mist eliminators are used at the exhaust points of tank vents and wet packed scrubbers to reduce emissions of aerosols and to conserve process and scrubbing solutions, respectively. Since the liquid droplets formed by mist eliminators return to the controlled device, there are no waste streams resulting from their application.

Mesh Pad Mist Eliminators
Mesh pad mist eliminators are used to recover electroplating chemicals of chromium electroplating and chromic acid anodizing. For caustic baths, mesh pads are used to prevent corrosion of the ventilation system. They are also used in scrubber systems for primary removal of particles. However, in this application, multiple exhaust streams are typically combined in a single mist eliminator, thus removing the possibility of chemical recovery.

Mesh pads are considered more efficient than liquid scrubbers. They use smaller amounts of water, making chemical recovery feasible. In a typical arrangement, a mesh pad mist eliminator serves a single electroplating tank and is installed in the ventilation system. The cross sectional area of the exhaust duct is increased by the unit, reducing the velocity of the exhaust stream and allowing electroplating solution to adhere to the mesh pads. Removal efficiency is increased by
adding mesh pads. The pads are periodically washed down and the collected electroplating solution is returned to the electroplating bath.

**Non-PFOS Chemical Fume Suppressants**

Chemical fume suppressants (CFS) are chemical agents that reduce or suppress fumes or misting at the surface of chromium electroplating baths. There are two basic types of fume suppressants: wetting agents (surfactants) and foam blankets. Wetting agents lower the surface tension of electroplating baths to reduce misting. Foam blanket fume suppressants, in which foam layers are generated across electroplating baths when current is applied, physically trap mists.

Previously, all fume suppressants that were CARB-certified to achieve a hexavalent chromium emission rate of 0.01 milligrams per ampere-hour (mg/A-hr) contained PFOS. However, in July 2010, California’s Office of Environmental Health Hazard Assessment (OEHHA) reported that PFOS compounds possess persistent, bioaccumulative, and toxic characteristics. On February 8, 2012, the USEPA published a supplemental study to revise emissions limits for total chromium and required the phase-out of the use of PFOS-based fume suppressants.

The 2012 NESHAP addressed chemical fume suppressants by prohibiting the addition of PFOS-based chemical fume suppressants effective September 21, 2015. Additionally, the chemical fume suppressant utilized in electroplating or anodizing tanks shall reduce surface tensions to < 40 dynes/cm when using a stalagmometer, or < 33 dynes/cm when using a tensiometer.

On September 2015, SCAQMD and CARB were given the respective authority to extend the compliance deadline prohibiting the use of PFOS-based chemical fume suppressants. SCAQMD and CARB granted a one-year extension to chromium electroplaters and chromic acid anodizing facilities. SCAQMD sent out amended Permits to Operate to impacted facilities to reflect the extension to allow the addition of a CFS containing PFOS until September 21, 2016 or when a certified product becomes available.

SCAQMD and CARB has since certified several non PFOS-based fume suppressants that meet the hexavalent chromium emission limit of 0.01 mg/A-hr at or below the required surface tension. The certified suppressants for hard chrome plating and chromic acid anodizing and decorate chrome plating are as follows:

**Table 1-5: Certified Hard Chrome Plating Fume Suppressants**

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Stalagmometer Measured Surface Tension (dynes/cm)</th>
<th>Tensiometer Measured Surface Tension (dynes/cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atotech USA</td>
<td>Fumetrol 21 LF2</td>
<td>≤ 30</td>
<td>≤ 27</td>
</tr>
<tr>
<td>Hunter Chemical LLC</td>
<td>HCA-8.4</td>
<td>≤ 33</td>
<td>≤ 30</td>
</tr>
</tbody>
</table>
Table 1-6: Certified Chromic Acid Anodizing/Decorative Chrome Plating Fume Suppressants

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Stalagmometer Measured Surface Tension (dynes/cm)</th>
<th>Tensiometer Measured Surface Tension (dynes/cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunter Chemical LLC</td>
<td>HCA-8.4</td>
<td>≤ 25</td>
<td>≤ 22</td>
</tr>
<tr>
<td>MacDermid Enthone</td>
<td>Macuplex STR NPFX</td>
<td>≤ 32</td>
<td>≤ 30</td>
</tr>
<tr>
<td>ProCom LLC</td>
<td>Dicolloy CRPF</td>
<td>≤ 32</td>
<td>≤ 29</td>
</tr>
</tbody>
</table>

While non PFOS-based fume suppressants have proven to successfully meet the limits, performance testing reviewed by SCAQMD staff and accounts from industry have found that they degrade at a faster rate than PFOS-containing suppressants, and must be replenished more frequently.
CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULE 1469

PROPOSED AMENDMENTS TO RULE 1469
PROPOSED AMENDMENTS TO RULE 1469

Proposed amendments to Rule 1469 establishes additional requirements for facilities that conduct chromium electroplating or chromic acid anodizing. The intent of the rule is to further reduce hexavalent chromium emissions by addressing both fugitive emissions and point-source emissions. Fugitive hexavalent chromium emissions are addressed through additional housekeeping and maintenance activity requirements, and requiring building enclosures of areas that may lead to hexavalent chromium emissions. New point-source controls are required for hexavalent chromium-containing tanks that have been identified based on certain operating parameters to be sources of hexavalent chromium emissions. Facilities will also be required to conduct periodic source tests to verify that add-on air pollution control devices are performing as intended. This chapter outlines changes and additions made to the current version of Rule 1469, and is divided into sections as they appear in PAR 1469.

Purpose – Subdivision (a)
PAR 1469 adds the purpose of the rule which is to reduce hexavalent chromium emissions from facilities that perform chromium electroplating or chromic acid anodizing operations, and other activities that are generally associated with chromium electroplating and chromic acid anodizing operations.

Applicability – Subdivision (b)
PAR 1469 removes the language in this subdivision requiring compliance with SCAQMD Rule 1401 and Rule 1401.1. This language is unnecessary as there is nothing in PAR 1469 that would preclude compliance with SCAQMD Rule 1401 and Rule 1401.1. Similarly, the existing language transferred over from the state’s Chrome Plating ATCM regarding prohibitions on chromium electroplating and chromic acid anodizing kits have also been removed as Rule 1469 facilities are still subject to those requirements as it is state law.

Applicability of Proposed Amended Rule is based facilities that have chromium electroplating or chromic acid anodizing tanks. Proposed Amended Rule 1469 expands the applicability to other hexavalent chromium emitting process tanks that are associated with electroplating or chromic acid anodizing tanks.

Definitions – Subdivision (c)
PAR 1469 modifies or adds the definitions of the following terms used in the proposed amendment. Please refer to subdivision (b) of PAR 1469 for the definitions of:

- ADD-ON AIR POLLUTION CONTROL DEVICE (modified)
- AIR POLLUTION CONTROL TECHNIQUE (modified)
- APPROVED CLEANING METHOD (added)
- BARRIER (added)
- BREAKDOWN (removed)
- BUILDING ENCLOSURE (added)
- CHROMIUM ELECTROPLATING OR CHROMIC ACID ANODIZING KIT (added)
- EARLY EDUCATION CENTER (added)
- ENCLOSURE OPENING (added)
• FREEBOARD HEIGHT (added)
• FUGITIVE EMISSIONS (modified)
• HIGH EFFICIENCY PARTICULATE ARRESTORS (HEPA) (modified)
• HIGH EFFICIENCY PARTICULATE ARRESTORS (HEPA) VACUUM (added)
• LOW PRESSURE SPRAY NOZZLE (added)
• MECHANICAL FUME SUPPRESSANT (modified)
• ADD-ON NON-VENTILATED AIR POLLUTION CONTROL DEVICE (added)
• PERFLUOROCTANE SULFONIC ACID (PFOS) BASED FUME SUPPRESSANT (added)
• PERMANENT TOTAL ENCLOSURE (added)
• STALAGMOMETER (modified)
• TANK PROCESS AREA (added)
• TENSIOmeter (modified)
• TIER I HEXAVALENT CHROMIUM-CONTAINING TANK (added)
• TIER II HEXAVALENT CHROMIUM-CONTAINING TANK (added)
• WEEKLY (modified)

The added definitions for Tier I and Tier II Hexavalent Chromium-Containing Tanks are noteworthy as many of the proposed amendments to Rule 1469 are associated with the newly added tanks that are potential sources of hexavalent chromium emissions. The definitions for these tanks are as follows:

• TIER I HEXAVALENT CHROMIUM-CONTAINING TANK means a tank permitted as containing a hexavalent chromium concentration of 1,000 parts per million (ppm) or greater.

As discussed in Chapter 1, the SCAQMD staff sampled a number of tanks with results showing that some of these tanks that are not currently regulated by Rule 1469 can contain high levels of hexavalent chromium. A hexavalent chromium concentration of 1,000 ppm was selected as the defining limit as it currently is the level set in the federal NESHAP for Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks for which specified housekeeping practices are required. PAR 1469 proposes to require Tier I Hexavalent Chromium-Containing Tanks to be subject to both the existing and newly added requirements for housekeeping and best management practices of the rule.

There is greater concern for hexavalent chromium-containing that also operate under conditions that facilitate the generation of hexavalent chromium emissions to outside of a tank. Operating conditions that can generate emissions include those tanks that are heated, air sparged or electrolytic. High concentrations of hexavalent chromium were found in some tanks such as sodium dichromate seal tanks and chrome stripping tanks that exhibited significant hexavalent chromium emissions due to these identified operating conditions. As such, these tanks are newly defined as follows:
• TIER II HEXAVALENT CHROMIUM-CONTAINING TANK means a TIER I HEXAVALENT CHROMIUM-CONTAINING TANK that meets any one of the following:
  o Has an operating temperature above 140 Degrees Fahrenheit; or
  o Uses air sparging as an agitation method; or
  o Is electrolytic.

Based on SCAQMD sampling and testing data discussed in Chapter 1, tanks containing 1,000 ppm of hexavalent chromium that are operated at or below 140 Degrees Fahrenheit have not been shown to exhibit elevated hexavalent chromium emissions. Therefore this is the temperature level that has been selected to act as one of the thresholds determining a Tier II Hexavalent Chromium-Containing Tank. Tier II Hexavalent Chromium-Containing Tanks are subject to separate requirements for emission controls explained further below in this chapter, in addition to proposed housekeeping requirements and best management practices.

Requirements – Subdivision (d)

Requirements for Air Sparging

During the rule development process, staff considered prohibiting air sparging. Provisions under paragraph (d)(3) have been retained that only allow air sparging when electroplating is not occurring or while chromic acid is being added. By definition of a Tier II Hexavalent Chromium Containing Tank any air sparged tank over a hexavalent chromium concentration of 1,000 ppm will be required to meet the emission limits specified under paragraph (h)(4) which will require add-on pollution controls. In addition, staff will be updating the source test protocol requirements to ensure that tanks that are air sparged are operated as such during the source test.

Air sparging has been demonstrated to be a driving mechanism for the creation of hexavalent chromium emissions for hexavalent-chromium containing tank solutions. SCAQMD staff has observed other mechanisms including mechanical agitation and eductors which can be used to perform agitation which facilities may elect to use instead of air sparging to avoid requirements for Tier II Hexavalent Chromium Containing Tanks.

Paragraph (d)(4) has been added to require any Tier I or Tier II Hexavalent Chromium-Containing Tank existing before rule adoption that undergoes specific modifications to maintain a freeboard height of at least eight inches. A modification under this provision includes a dimensional change to the tank. Freeboard height is the vertical distance from the tank bath surface, including liquid or foam, to the lip of the tank with parts and equipment submerged in the tank. Existing practice by SCAQMD permitting staff during permit review requires new tanks to have a freeboard height of eight inches as recommended in the most current edition of the Industrial Ventilation, A Manual of Recommended Practice for Design, published by the American Conference of Governmental Industrial Hygienists. During the development of PAR 1469, industry stakeholders expressed that it would be difficult to modify existing tanks to conform to an eight-inch freeboard standard as process lines were designed to operate at specific tank dimensions. In addition, existing depth of tanks would not allow for a decrease in tank solution/level as parts would not be completely submerged or would not work with the height of
the existing rack system. Owner or operators can utilize other methods to increase the freeboard height of the tank such as installing tank wall extensions.

**Building Enclosures**

PAR 1469 adds requirements to operate any Tier I or Tier II Hexavalent Chromium-Containing Tank and associated process tanks within a building enclosure beginning 90 days after date of rule adoption. Building enclosures shall meet the following requirements:

- The combined area of all building enclosure openings, including any roof openings for passage of equipment or vents through which fugitive hexavalent chromium emissions can escape from the building enclosure, shall not exceed 3% of the building enclosure envelop, which is calculated as the total surface area of the building enclosure’s exterior walls, floor and horizontal projection of the roof on the ground. This requirement is based on EPA’s Method 204 for Permanent Total Enclosures, however, unlike Method 204, building enclosures under PAR 1469 are not required to be under negative air. As such, the requirement for a 5% allowance for openings in the building enclosure has been decreased to 3% to compensate for the absence of having a building enclosure vented to an add-on air pollution control device. Information on calculations for the building enclosure envelope, including locations and dimensions of openings counted toward the 3% allowance are required to be provided in the compliance status reports pursuant to paragraphs (p)(2) and (p)(3).

- Ensure that any building enclosure opening that is on opposite ends of the building enclosure where air movement can pass through are not simultaneously open except during the passage of vehicles, equipment or people by either closing or using one or more of the following methods for the enclosure opening(s) on one of the opposite ends of the building enclosure:
  - Automated roll-up door;
  - Overlapping plastic strip curtain;
  - Vestibule doors;
  - Airlock system; or
  - Alternative method to minimize the release of fugitive hexavalent chromium emissions from the building enclosure that the owner or operating can demonstrate to the Executive Officer as (an) equivalent or more effective method(s) to minimize the movement of air within the building enclosure.

- Except for the movement of vehicles, equipment or people, close any building enclosure opening or use any of the methods listed above, that directly faces and opens towards a sensitive receptor, school, or early education center that is located within 100 feet, as measured from the property line of the sensitive receptor, school, or early education center to the building enclosure opening.

- Ensure that all roof openings that are directly located within 30 feet from the edge of any Tier II Hexavalent Chromium-Containing Tank are closed, except for roof openings that are used to allow access for equipment or parts, or provide intake air for a building enclosure that does not create air velocities that impact the collection efficiency of a ventilation system for an add-on air pollution control device.

- Prohibit operation of any device in any building enclosure opening in the roof that pulls air from the building enclosure to the outdoor air unless the air is vented to an add-on air
pollution control device that is fitted with HEPA filters. The owner or operator is required to maintain HEPA filters as specified by the manufacturer.

The following additional requirements are also being proposed to ensure that building enclosures are being properly operated and maintained:

- Inspect any building enclosure at least once a calendar month for breaks or deterioration that could cause or result in fugitive emissions.
- Repair any breaks or deterioration that could or results in fugitive hexavalent chromium emissions from any building enclosure within 72 hours of discovery. An extension may be granted if the owner or operator can substantiate that the repair will take longer than that.

Regarding worker safety, stakeholders questioned which agency requirement for the construction and/or operation of building enclosure took precedent - SCAQMD or Cal-OSHA/federal OSHA. PAR 1469 requires that a building enclosure should not be designed to conflict with either agency’s requirements, and instead should be constructed in a manner that is compliant with all agencies. This may require the owner or operator of a facility to install additional equipment or modify the existing structure. If agency requirements conflict, the owner or operator shall contact the Executive Officer in writing within 30 days of rule adoption to explain which SCAQMD building enclosure requirements the facility cannot comply with, and the alternatives that the facility would implement to minimize the release of fugitive emissions. The Executive Officer shall notify the owner or operator within 60 days of receiving the request, if the submitted alternative compliance measures are approved. The owner or operator will have 90 days upon receiving approval from the Executive Officer to implement the approved alternative compliance measures. The owner or operator of a facility that implements and maintains the approved alternative compliance measures shall have met the applicable requirements specified in paragraphs (e)(1) through (e)(5).

Housekeeping Requirements – Subdivision (f)
PAR 1469 moves housekeeping requirements from the requirements subdivision to its own dedicated subdivision (f). Amended provisions include the following:

- References to using an approved cleaning method: Rule 1469 currently lists each type of cleaning method allowed in several provisions. PAR 1469 proposes to group these listed methods of cleaning into the term “approved cleaning method” (see definitions section). It should be noted that HEPA vacuum, included as an approved cleaning method, now requires the utilization of filters that are individually dioctyl phthalate tested (or equivalent) with 0.3 micron particles, and rated by the manufacturer to have a control efficiency of not less than 99.97 percent (see new definition for HEPA). The additional clarification is needed to prevent the usage of vacuum filters that do not meet specific certification testing standards. This includes preventing the use of retrofitted vacuums that were not specifically designed to operate with HEPA filters as defined by PAR 1469.
- Increase frequency of cleaning from weekly to daily: The cleaning up of surfaces that may be potentially contaminated with hexavalent chromium has been expanded to include Tier I or Tier II Hexavalent Chromium-Containing Tanks and to increase frequency from weekly to daily. Tier I or Tier II Hexavalent Chromium-Containing Tanks are sources of hexavalent chromium and its liquid can become fugitive emissions in the same manner as
liquid from electrolytic tanks. The frequency of cleaning has been increased to ensure that there is no build-up and there is reduced opportunity for liquid to be transported outside of the tank process area. Many facilities indicated that cleanup activities are already performed on a daily basis during site visits and on facility surveys.

- Paragraph (f)(5) was modified to require that containers that contain chromium or chromium-containing waste material shall be kept closed at all times except when filling or emptying. Based on site-visits, many facilities were already implementing this practice. Waste containers can be a source of hexavalent chromium if left open and this codifies a current practice.

- Paragraph (f)(6) was restructured to only pertain to the cleaning requirements in the buffing, grinding, or polishing area. On each day when buffing, grinding, or polishing, the owner or operator shall clean floors within 20 feet of a buffing, grinding, or polishing workstation and any entrance/exit point within one hour of the end of the last operating shift of when buffing, grinding, or polishing are conducted. Requirements of how buffing, grinding, or polishing is conducted at a facility has been moved to paragraph (g)(5) in Best Management Practices.

- Paragraph (f)(7) has been added to require owners or operators to remove any flooring in the tank process areas that is made of fabric or fibrous material such as carpets or rugs where hexavalent chromium materials can be trapped. Examples of acceptable flooring material are wooden floor boards and other solid material, cleaned and maintained as prescribed by the rule, that do not absorb hexavalent chromium-containing liquid.

**Best Management Practices – Subdivision (g)**

PAR 1469 creates a new subdivision (g) for Best Management Practices. Best Management Practices are prescribe how an owner or operator shall conduct electroplating or anodizing and other ancillary operations to prevent the release or generation of fugitive emissions.

Paragraph (g)(1) expands the requirements for the minimization of drag-out to include Tier I or Tier II Hexavalent Chromium-Containing Tanks. For facilities with automated lines, the owner or operator shall now be able to utilize technologies other than drip trays to prevent hexavalent chromium-containing liquid from falling between spaces. Cleaning requirements additionally includes cleaning of residue on the drip tray or other equipment used for containment. Facilities without automated lines shall handle parts in a manner that does not cause hexavalent chromium-containing liquid to drop on the floor. Owners or operators may implement different methods or technologies to limit the dripping of hexavalent chromium-containing liquid.

Paragraph (g)(2) modifies existing requirements for spraying down of parts or equipment. Owners or operators may spray rinse the part or equipment if they are fully lowered inside a tank where the overspray and all of the liquid is captured inside the tank. If an owner or operator chooses to spray rinse above a process tank, they must ensure that any hexavalent chromium-containing liquid is captured and returned to the tank, and:

- Install a splash guard at the tank that are free of holes, tears or openings. Splash guards shall be cleaned weekly, such that there is no accumulation of visible dust or residue potentially contaminated with hexavalent chromium; or
For tanks located within a process line utilizing an overhead crane system that would be restricted by the installation of splash guards, a low pressure spray nozzle may instead be used and operated in a matter that water flows off of the part or equipment.

During the development of PAR 1469, industry stakeholders requested consideration of the practice of using spray nozzles on the rack system that would rinse the part prior to moving onto the next finishing process. The water would be either applied in a misting manner or with a low pressure spray nozzle that does not create overspray. The low pressure spray was determined to be 35 pounds per square inch. The water and any chromium containing liquid would drip down to a tank below the rack system, thereby reducing drag-out of hexavalent chromium-containing liquid.

Paragraph (g)(3) requires owners or operators to label each tank within the tank process area with a tank number or other identifier, bath contents, maximum concentration (ppm) of hexavalent chromium, operating temperature range, and any agitation method used.

Paragraph (g)(4) requires that the owner or operator of a Tier II Hexavalent Chromium-Containing Tank that is subject to paragraph (d)(4), shall make inch markings on the interior of the tank that indicates the location that is eight inches below the lip of the tank. This requirement allows the owner, operator, or SCAQMD personnel to verify that the freeboard of tank is being maintained at the required height.

Paragraph (g)(5) requires all buffing, grinding, and polishing operations to take place within a building enclosure, while paragraph (g)(6) relocates the existing requirement to have a barrier that separates the buffing, grinding, or polishing area within a facility from the chromium electroplating or chromic acid anodizing operation. Both requirements prevent the generation of particulates that could act as a transportation medium for hexavalent chromium.

Paragraph (g)(7) prohibits compressed air cleaning or drying within 15 feet of any hexavalent chromium electroplating or chromic acid anodizing operations unless a barrier separates those areas from compressed air cleaning or drying operation, or the compressed air cleaning or drying is conducted in a permanent total enclosure. The concern is that particulates from those areas may become airborne, or the compressed air cleaning/drying may be conducted in a manner that impacts the collection efficiency of an add-on air pollution control device.

**Add-On Air Pollution Control Devices and Emission Standards – Subdivision (h)**

PAR 1469 creates a new subdivision (h) for requirements regarding add-on air pollution control devices and emission standards. Paragraph (h)(2) now consolidates the emission standards and control requirements for existing, modified, and new hexavalent hard and decorative chromium electroplating and chromic acid anodizing facilities (see definitions) into Table 1. Additionally, all effective dates for notification to the Executive Officer, emission standards, and control requirements were removed as these dates are now past and in full effect.
Table 2-1: Hexavalent Chromium Emission Limits for Existing Tanks

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Distance to Sensitive Receptor (meters)</th>
<th>Annual Permitted Amp-Hrs</th>
<th>Emission Limit (mg/amp-hr)</th>
<th>Required Air Pollution Control Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Facility</td>
<td>&lt; 100</td>
<td>≤ 20,000</td>
<td>0.01</td>
<td>Use of Certified Chemical Fume Suppressant. Alternatively, a facility may install an add-on air pollution control device(s) or add-on non-ventilated air pollution control device(s) that controls hexavalent chromium emissions to below 0.0015 mg/amp-hr.</td>
</tr>
<tr>
<td>Existing Facility</td>
<td>&lt; 100</td>
<td>&gt; 20,000</td>
<td>0.0015</td>
<td>Add-on air pollution control device(s) or add-on non-ventilated air pollution control device(s).</td>
</tr>
<tr>
<td>Existing Facility</td>
<td>&gt; 100</td>
<td>≤ 50,000</td>
<td>0.01</td>
<td>Use of Certified Chemical Fume Suppressant. Alternatively, a facility may install an add-on air pollution control device(s) or add-on non-ventilated air pollution control device(s) that controls hexavalent chromium emissions to below 0.0015 mg/amp-hr.</td>
</tr>
<tr>
<td>Existing Facility</td>
<td>&gt; 100</td>
<td>&gt; 50,000 and &lt; 500,000</td>
<td>0.0015</td>
<td>Use of an air pollution control technique approved by the Executive Officer.</td>
</tr>
<tr>
<td>Existing Facility</td>
<td>&gt; 100</td>
<td>&gt; 500,000</td>
<td>0.0015</td>
<td>Add-on air pollution control device(s) or add-on non-ventilated air pollution control device(s).</td>
</tr>
<tr>
<td>Modified Facility</td>
<td>Any</td>
<td>Any</td>
<td>0.0015</td>
<td>Using an add-on air pollution control device(s), or an approved alternative method pursuant to subdivision (i) to control hexavalent chromium emissions.</td>
</tr>
<tr>
<td>New Facility</td>
<td>Any</td>
<td>Any</td>
<td>0.0011</td>
<td>Using a HEPA add-on air pollution control device, or an approved alternative method pursuant to subdivision (i) to control hexavalent chromium emissions.</td>
</tr>
</tbody>
</table>

Subparagraph (h)(2)(b) retains the siting requirements for New Chromium Electroplating and Chromic Acid Anodizing Facilities.

All requirements to conduct a facility-wide screening health risk assessment have been removed in this subdivision because these assessments are currently addressed by SCAQMD’s ongoing program for new source review of toxics (Rule 1401 and 1401.1) and implementation of AB2588 (Rule 1402).

Paragraph (h)(3) applies to decorative chromium electroplating processes using a trivalent chromium bath. PAR 1469 removes the requirement to utilize a certified chemical fume suppressant, as certification at the federal and state level only require this of hexavalent chromium electroplating and chromic acid anodizing operations, however, adds that chemical fume suppressants cannot contain PFOS for consistency with the NESHAP for Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks.
Emission Controls and Standards for Tier II Hexavalent Chromium-Containing Tanks

Paragraph (h)(4) adds new requirements for Tier II Hexavalent-Chromium Containing Tanks that are not chromium electroplating or chromic acid anodizing tanks. These tanks are required to be vented to an add-on air pollution control device and must meet the following standards:

- For existing facilities, 0.0015 mg/amp-hr, if any tanks that are vented are electrolytic; or
- For new facilities, 0.0011 mg/amp-hr, if any tanks that are vented are electrolytic; or
- 0.20 mg/hr, if all tanks that are vented are not electrolytic

For existing and new facilities with non-chromium electroplating or chromic acid anodizing Tier II tanks that are electrolytic, the emission standard is consistent with the emission standard in Table I of PAR 1469 for chromium electroplating and chromic acid anodizing tanks.

The emission limit for non-electrolytic tanks is based on review of 80 source tests conducted on existing add-on air pollution control equipment venting chromium electroplating and chromic acid anodizing tanks. The source tests were conducted from 1999 through 2016. Of the 80 source tests, approximately 20 source tests were not used in the analysis as they either vented multiple electroplating or anodizing tanks or the source test was conducted with very high amperes that were not representative of the normal operations. The average emission rate for the remaining source tests was 0.18 mg/hr. Additionally, due to the fact that uncontrolled hexavalent chromium emissions from non-electrolytic tanks are typically much lower than that of electroplating and anodizing tanks, staff believes that these non-chromium electroplating or chromic acid anodizing Tier II tanks can meet an emission limit of 0.20 mg/hr.

For Tier II Hexavalent Chromium-Containing Tanks that are in operation prior to date of rule adoption, the owner or operator shall submit a permit application to the SCAQMD for the add-on air pollution control devices based on the primary electrolytic operation conducted at the facility as specified in the table below.

<table>
<thead>
<tr>
<th>Electrolytic Process at the Facility</th>
<th>Compliance Date for Permit Application Submittal for Add-on Air Pollution Control Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromic Acid Anodizing</td>
<td>[180 Days after Date of Adoption]</td>
</tr>
<tr>
<td>Hard Chromium Electroplating</td>
<td>[270 Days after Date of Adoption]</td>
</tr>
<tr>
<td>Decorative Chromium Electroplating</td>
<td>[365 Days after Date of Adoption]</td>
</tr>
</tbody>
</table>

If a facility has multiple chromium electrolytic processes occurring, the earliest compliance date would apply to the facility.

The add-on air pollution control device shall be installed and operated no later than one year after a Permit to Construct is issued. Beginning no later than 30 days after rule adoption until the subject add-on air pollution control device is installed, the owner or operator is required to cover the subject tank no later than 30 minutes after ceasing operation of the tank. Tank covers are to be free of holes, tears, or gaps and handled in a manner that does not lead to fugitive emissions.
Owners or operators shall not be subject to the requirements of venting a Tier II Hexavalent Chromium-Containing Tank to an add-on air pollution control device if the uncontrolled hexavalent chromium emission rate is less than the applicable emission rate limit of subparagraph (h)(4)(A), as demonstrated by a SCAQMD-approved source test conducted pursuant to the Technical Guidance Document for Measurement of Hexavalent Chromium Emissions from Chromium Plating and Chromic Acid Anodizing Operations for Certification of Wetting Agent Chemical Mist Suppressant Subject to SCAQMD Rule 1469. The technical guidance document referenced uses the same process in certifying chemical fume suppressants.

Paragraph (h)(5) requires facilities to operate add-on air pollution controls at the applicable minimum hood induced capture velocity specified in the most current edition of the Industrial Ventilation, A Manual of Recommended Practice for Design.

**Alternative Compliance Methods for New, Modified, and Existing Hexavalent Decorative and Hard Chromium Electroplating and Chromic Acid Anodizing Facilities – Subdivision (i)**

PAR 1469 removes the following paragraphs as they refer to past interim compliance options:
- Alternative Interim Compliance Options – Inventory and Health Risk Assessment
- Alternative Interim Compliance Options – Emission Reduction Plan
- Alternative Interim Compliance Options – Facility wide Mass Emission Rate
- Alternative Interim Compliance Options – Alternative Standards for Existing Hexavalent Chromium Electroplating and Chromic Acid Anodizing Facilities with Low Annual Ampere Hour Usage

The alternative interim compliance options are no longer options and facilities will be required to comply with the respective requirements specified in subdivision (h). Subdivision (i) does, however, retain the option to operate under an alternative compliance method as currently allowed for in Rule 1469. The alternative compliance option is available for existing, new, and modified facilities if the owner or operator can demonstrate that the alternative method(s) is enforceable, provides an equal or greater hexavalent chromium reduction, or greater risk reduction than would direct compliance with the requirements of paragraph (h)(2).

**Training and Certification – Subdivision (j)**

This section has been moved to its own dedicated subdivision (j) with no modifications to existing requirements.

**Source Test Requirements and Test Methods – Subdivision (k)**

The subdivision has been renamed and relocated from subdivision (e) to (k). Currently, Rule 1469 only requires a source test either by 2009 or during installation. SCAQMD staff believes that periodic source tests are necessary to verify the continued performance of both the capture and control of hexavalent chromium emissions for add-on air pollution control devices specified in this rule. Although parameter monitoring can verify the operation of specific elements of the add-on air pollution control device, source tests allows for the comprehensive evaluation of the system.
The owner or operator using air pollution control techniques to comply with applicable emission limits of this rule shall conduct an initial source test to demonstrate compliance with applicable emission standards, with subsequent periodic source testing or emissions screening testing at least once every 36 months thereafter as specified in paragraph (k)(3). Failure to retest following a failed or unsuccessful source test within 60 days shall constitute a violation of this rule.

Paragraph (k)(3) sets forth requirements for source testing and emissions evaluation compliance dates. The initial source test must be conducted 120 days after approval of the initial source test protocol. The due to date to submit an initial source test protocol is based on the facility’s permitted annual ampere-hours, with facilities that have higher permitted limits required to submit sooner. A source test conducted after September 1, 2015 may be used to demonstrate compliance with the initial source test requirement. If not previously approved by SCAQMD, the owner or operator shall submit the source test to SCAQMD no later than 30 days after adoption of the rule. The Executive Officer shall notify the owner or operator within 30 days of receiving the source test results if it has demonstrated compliance with applicable emission limits, is representative of the method to control emissions currently in use, and the test was conducted using one of the approved test methods specified in the rule. A source test used to demonstrate compliance with the initial source test requirement will be required to conduct a subsequent source test no later than 36 months from the adoption date of the rule instead of 36 months from the date of the subject source test.

In lieu of conducting a source test for subsequent tests, the owner or operator may conduct an emission screening of hexavalent chromium as long as it:
- follows a source test protocol previously submitted and approved by SCAQMD;
- consists of one run to evaluate the capture and control of hexavalent chromium emissions; and
- is representative of operating conditions at the facility.

Additionally, facilities with a District-approved source test conducted after October 24, 2009 will be allowed to conduct an emission screening to satisfy the requirements of conducting the initial source so long as the subject source test met the criteria stated above.

The emission screening of hexavalent chromium will show whether the air pollution control technique is operating and performing as intended. While parameter monitoring may evaluate the performance of capture periodically, the emission screening allows the verification of emission limits. Owners or operators may utilize this option as a method to reduce the costs for potential work hours lost or having a source testing company conduct multiple runs. Within 30 days of receiving the results of the emission screening, the owner or operator shall submit the results to SCAQMD. The owner or operator will be required to conduct a complete source test using an approved method within 60 days of conducting an emission screening that fails the capture efficiency test(s) specified in the source test protocol, exceeds an emission limit specified in the Permit to Operate, or exceeds an emission standard of the rule.

The owner or operator shall submit a source test protocol for source tests required under subdivision (k) as specified below in Table 3:
Table 3: Submittal Dates of Source Test Protocol

<table>
<thead>
<tr>
<th>Permitted Air Pollution Control Technique</th>
<th>Facility Permitted Annual Ampere-Hours</th>
<th>Due Date of Initial Source Test Protocol</th>
<th>Due Date of Subsequent Source Test Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing on or Before [Date of Adoption]</td>
<td>&gt; 20,000,000</td>
<td>No later than [180 Days After Date of Rule Adoption]</td>
<td>180 Days Prior to Due Date of Subsequent Source Test</td>
</tr>
<tr>
<td></td>
<td>≤ 20,000,000 and &gt; 1,000,000</td>
<td>No later than [365 Days After Date of Rule Adoption]</td>
<td>180 Days Prior to Due Date of Subsequent Source Test</td>
</tr>
<tr>
<td></td>
<td>≤ 1,000,000</td>
<td>No later than [545 Days After Date of Rule Adoption]</td>
<td>180 Days Prior to Due Date of Subsequent Source Test</td>
</tr>
<tr>
<td>New or Modified After [Date of Adoption]</td>
<td>Any</td>
<td>60 days After Initial Start-Up</td>
<td>180 Days Prior to Due Date of Subsequent Source Test</td>
</tr>
</tbody>
</table>

The submission of the source test protocol is separated into three categories based on the facility permitted ampere-hours with the most recent SCAQMD approved source test being able to be used for subsequent source tests if there are no changes since the last successful SCAQMD approved source test.

**Capture Efficiency**

PAR 1469 specifies that the owner or operator using an add-on air pollution control device or add-on non-ventilated air pollution device shall demonstrate that all emissions are captured by measuring collection slot velocity and the push air manifold pressure. The demonstration shall be made during any source test. Additional parameter monitoring shall take place at least once every 180 days. An adequate collection slot velocity is required to ensure that collection of hexavalent chromium emissions is at the level measured during the source test.

A deficient measurement would indicate that the hexavalent chromium emissions are not being collected and being controlled by the add-on air pollution control device. If the measurement of a collection slot velocity is measured in the “repairable measurement” of 90-95% of the most recent passing source or emission screening or less than 2,000 feet per minute (fpm) and greater than 1,800 fpm, the owner or operator shall repair or repair and re-measure within 3 calendar days of the measurement. The tank controlled by the add-on air pollution control device may continue to operate with the add-on air pollution control device in operation. If the owner or operator fails to demonstrate that the collection slot is in the “acceptable measurement” range, greater than 95% of the most recent source test or emission screening or greater than 2,000 fpm, the owner or operator shall shut-down any tanks associated with the any add-on air pollution control devices associated with the collection slot.
If the measurement of the collection slot velocity is measured to be in the “failing measurement” range, the owner or operator shall immediately shut-down any tanks associated with any air add-on air pollution control devices associated with the collection slot. This prevents the owner or operator from operating a tank that may be emitting hexavalent chromium since the hexavalent chromium emissions are not being sufficiently collected. The owner or operator shall demonstrate that the collection slot is in the “acceptable measurement” by re-measuring the collection slot velocity under typical operating conditions of the tank, with the exception of the suspension of electrolytic operations, prior to resuming electrolytic operations.

<table>
<thead>
<tr>
<th>Collection Slot(s) Velocity</th>
<th>Push Air Manifold Pressure (for push-pull systems only)</th>
<th>Required Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptable Measurement</td>
<td>&gt; 95% of the most recent source test or emission screening; or ≥ 2,000 fpm</td>
<td>95-105% compared to the most recent passing source test or emission screening</td>
</tr>
<tr>
<td>Repairable Measurement</td>
<td>90-95% of the most recent passing source test or emission screening test, or &lt; 2,000 fpm and &gt; 1,800 fpm</td>
<td>90-110% of the most recent passing source test or emission screening test</td>
</tr>
<tr>
<td>Failing Measurement</td>
<td>&lt; 90% of the most recent passing source test or emission screening test, or &lt;1,800 fpm</td>
<td>&gt; 110% or &lt; 90% of the most recent passing source test or emission screening test, or [TBD] pounds per square inch</td>
</tr>
</tbody>
</table>

PAR 1469 expands on the requirements of the smoke test to clarify that both add-on air pollution control devices and add-on non-ventilated air pollution control devices are to be tested. Add-on air pollution control devices have emission collection systems and the smoke tests demonstrates through a qualitative evaluation that emissions coming from the tank are being collected. Add-on non-ventilated air pollution control devices typically do not have an emissions collection system and a smoke test would demonstrate the containment of hexavalent chromium emissions by devices such as tank covers and merlin hoods.

**Certification of Wetting Agent Chemical Fume Suppressant – Subdivision (l)**

PAR 1469 modifies the existing requirements by prohibiting the addition of PFOS-based fume suppressants and lowering the minimum surface tension of the tank to 40 dynes/cm, as measured by the stalagmometer, or below 33 dynes/cm, as measured by a tensiometer. This modification is made to be consistent with the federal NESHAP for Chromium Electroplating.

**Parameter Monitoring – Subdivision (m)**

PAR 1469 modifies the section to require revised and additional parameter monitoring requirements for add-on air pollution control devices.

**Pressure Drops**

PAR 1469 specifies that the acceptable range of a pressure drop of an add-on air pollution control device shall be specified in the Permit to Operate with an acceptable pressure drop range marked on the gauge. This requirement was modified based on input from stakeholders indicating that the acceptable performance range of current add-on air pollution control devices in some cases were greater than -1/2 to +2 times the inches of water. As a result, the pressure
drop range will be determined during the permit processing phase of the equipment where SCAQMD staff can evaluate information such as manufacturer’s specifications and certifications, source test results, and other resources.

**HEPA Filters**
The owner or operator of an add-on air pollution control device equipped with HEPA filters shall ensure that the monitoring device for pressure drop:

- Is equipped with ports to allow for periodic calibration in accordance with manufacturer’s specifications;
- Is calibrated according to manufacturer’s specification at least once every calendar year; and
- Is maintained in accordance with the manufacturer’s specification.

**Differential and Static Pressure**
PAR 1469 requires additional monitoring of operational parameters. The owner or operator must continuously monitor the operation of the add-on air pollution control device by installing and maintaining mechanical gauges to ensure the applicable pressures and air flows are maintained at the push manifold, collection manifold, and across each stage of the control device. Each mechanical gauge shall be installed so that it is easily visible and in clear sight of the operation or maintenance personnel. The differential or static pressure shall be maintained within the value established during the source test and specified in the Permit to Operate. The gauges shall be labeled with the acceptable operating pressure and/or airflow ranges.

**Wetting Agent Chemical Fume Suppressants (Excluding Decorative Chromium Electroplating Tanks Using a Trivalent Chromium Bath)**
The requirement to measure weekly after 20 daily measurements of surface tension with no violation has been modified to every third operating day, not less than a weekly frequency. The required non-PFOS chemical fume suppressants evaporate and degrade faster than the PFOS-containing products. SCAQMD staff is concerned that this faster degradation can result in faster increases to surface tensions values. More frequent periodic monitoring of tank bath surface tensions will ensure that an adequate amount of chemical fume suppressants are being used to comply with the surface tension limits specified in the rule and permit conditions.

**Inspection and Maintenance & Operation and Maintenance Plan – Subdivision (n)**
The requirements for inspection and maintenance & the operation and maintenance plan apply to add-on air pollution control devices or alternative add-on air pollution control devices. The existing table previously found in Table 4 has been moved to Appendix 4 and incorporates the newly added parameter monitoring requirements of subdivision (l). The existing requirements for facilities using chemical fume suppressants or mechanical fume suppressants has also been moved to Appendix 4, Table 4-2. PAR 1469 also combines the existing requirements for the operation and maintenance plan into this subdivision.

**Recordkeeping and Reporting – Subdivisions (o) and (p)**
PAR 1469 clarifies that the inspection records apply to facilities using either an add-on air pollution control devices or an alternative add-on air pollution control devices. Additional
recordkeeping requirements have been included to reflect the proposed provisions for building enclosures, housekeeping, best management practices, periodic source tests, capture efficiency tests, emission screening, and parameter monitoring.

As part of the ongoing compliance status and emission reports (specified in Appendix 3), facilities should report the results of add-on air pollution ventilation measures conducted during the most recent source test. Information would include the velocity of each collection slot and push air manifold. Facilities must also report any pollution prevention measures that have been implemented that eliminate or reduce the use of hexavalent chromium in the chromium electroplating or chromic acid anodizing process. Also required in the compliance status reports are calculations for building enclosure envelopes, including locations and dimensions of openings counted towards the 3% allowance.

PAR 1469 revises “Reports of Breakdowns” to “Notification of Incident”. As background, SCAQMD Rule 430 provides breakdown coverage, where the facility may not be in violation of a permit condition or rule requirement, if the Executive Officer determines that it was a valid breakdown based on evidence provided by the owner or operator. However, the existing reference to Rule 430 in Rule 1469 is conflicting as Rule 430 does not apply to any Regulation XIV rules.

As a result, PAR 1469 replaces breakdown provisions with “Notification of Incident” which incorporates similar notification language used in Rule 430 by requiring the owner or operator to notify SCAQMD via 1-800-CUT-SMOG within one hour of the incident or within one hour of the time the owner or operator knew or reasonably should have known of the following:

- Any failed smoke test
- Any failed source test
- An exceedance of a permitted ampere-hour limit
- A malfunction of a non-resettable ampere-hour meter

A supplemental report is required to be submitted no later than 30 calendar days from the date of incident.

New and Modified Sources (removed)
PAR 1469 removes previous subdivision (l) relating to New and Modified Sources as facilities are required to submit a permit prior to altering or installing equipment under existing SCAQMD rules for permitting (Regulation II) and toxic new source review (Rule 1401).

Exemptions – Subdivision (q)
Due to the new requirements for Tier I and II Hexavalent Chromium-Containing Tanks, PAR 1469 removes the exemption for process tanks associated with a chromium electroplating or chromic acid anodizing process in which neither chromium electroplating nor chromic acid anodizing is taking place. One of the objectives of PAR 1469 is to control emissions from tanks that were identified as sources of hexavalent chromium where neither electroplating nor chromic acid anodizing is taking place.
PAR 1469 also removes the exemption that would suspend requirements during periods of equipment breakdown. As discussed earlier, references to Rule 430 have been removed due to the lack of applicability to Regulations XIV.

**Title V Permit Requirements (removed)**
PAR 1469 removes the subdivision as SCAQMD Rule 3002 already requires a facility to obtain a Title V permit and comply with the conditions. Therefore this subdivision is unnecessary and duplicative.

**Chromium Electroplating or Chromic Acid Anodizing Kits Requirements (removed)**
PAR 1469 removes the requirements for chromium electroplating or chromic acid anodizing kits as this existing language was from the state’s Chrome Plating ATCM regarding prohibitions on chromium electroplating and chromic acid anodizing kits. This language has been removed as Rule 1469 facilities are still subject to those requirements under state law.

**Conditional Requirements for Permanent Total Enclosure – Subdivision (t)**
PAR 1469 includes conditional requirements for the owner or operator to install a permanent total enclosure if:

- More than one non-passing source test as required in paragraph (k)(1) occurred within a consecutive 48-month period; or

- More than one failure of the owner or operator to cease operating an electroplating or anodizing line associated with a failed measurement of the collection system of an add-on air pollution control device, or a failed smoke test of an add-on air pollution control device or add-on non-ventilated air pollution control device within a consecutive 48-month period.

Permanent total enclosures will be required to vent to an add-on air pollution control device that is fitted with HEPA filters, or other filter media that is rated by the manufacturer to be equally or more effective, and designed in a manner that does not conflict with requirements or guidelines set forth by OSHA or CAL-OSHA regarding worker safety, or the National Fire Protection Association regarding safety. Permit applications for permanent total enclosures shall be submitted to the Executive Officer as follows:

- No later than 180 days after notification by the Executive Officer if the property line of the facility is within 500 feet of the property line of any sensitive receptor, school, or early education center.

- No later than 270 days after notification by the Executive Officer for all other facilities.

Installation of the permanent total enclosure shall be completed no later than 12 months after the Permit to Construct is issued by the Executive Officer.

Under the proposed amended rule, the owner or operator would be allowed to contest the requirement to install a permanent total enclosure within 30 days of receiving notification from the Executive Officer that the requirement had been triggered. A written report contesting the requirement shall include evidence that installation of the permanent total enclosure is not warranted based on the following criteria:
The specified incidences of non-compliances did not occur; and
- The owner or operator resolved the specified incidences of non-compliances in a timely manner; and
- The owner or operator implemented specific measures minimize the hexavalent chromium emissions.

The Executive Officer will use the information in the written report to determine whether the permanent total enclosure is required and will notify the owner or operator within 90 days of receiving the written report.

**Hexavalent Chromium Phase-out – Subdivision (u)**

Owners and operators of facilities with an existing Tier II tank that plan to eliminate or reduce hexavalent chromium concentrations within the tank shall not be subject to the requirements of paragraph (h)(4) to vent the tank to an add-on air pollution control device. In order to qualify for this exemption, facilities must submit a plan to the Executive Officer for approval that includes:

- The method by which the hexavalent chromium concentration will be eliminated or reduced and expected completion date; and
- A list of milestones necessary to occur, including their projected dates; and
- A list of all control measures that will be implemented until the concentration is eliminated or reduced.

Facilities must also submit a monthly progress report and update the Executive Officer regarding any revisions to the original plan. Implementation of the plan must be completed within 2 years of approval of the Hexavalent Chromium Phase-Out Plan. In addition, facilities unable to eliminate or reduce emissions by the expected completion date or if a Phase-Out Plan is denied after it is resubmitted, the owner or operator must submit permit applications for add-on air pollution control devices within 30 days of when they knew, or should have known that they could not meet the date. The add-on air pollution control device must be installed no later than 180 days after a Permit to Construct is issued.
CHAPTER 3: IMPACT ASSESSMENT

AFFECTED SOURCES
EMISSION IMPACTS
CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)
SOCIOECONOMIC IMPACT ASSESSMENT
DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY
   CODE SECTION 40727
COMPARATIVE ANALYSIS
AFFECTED FACILITIES
Based on site visits conducted by SCAQMD staff, SCAQMD permit database, internet searches, and third party sources, there are a total of 117 facilities that either conduct chromium electroplating or chromic acid anodizing. SCAQMD staff conducted site visits at 39 facilities, each with a variety of air pollution controls and operations.

EMISSION IMPACTS
PAR 1469 affects 117 facilities conducting electroplating or anodizing that use hexavalent chromium or trivalent chromium. Implementation of PAR 1469 will reduce both point (requiring controls on previously uncontrolled tanks) and fugitive emissions (improved housekeeping and requiring operations being conducted in a building). Quantifying the point source emissions reductions is difficult as there is large variance of hexavalent chromium emissions between the tanks and there is a limited amount of source tests. The ambient air concentration of other TACs generated during the metal finishing operation may be reduced as well.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)
Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, the SCAQMD, as lead agency for the proposed project, will be reviewing PAR 1469 and will determine if PAR 1469 will result in any potential adverse environmental impacts. Appropriate CEQA documentation for the proposed project will be prepared based on the analysis. In the event that the proposed project may have statewide, regional, or area-wide significance, a CEQA scoping meeting is required pursuant to Public Resources Code section 21083.9(a)(2) and will be held concurrently at the Public Workshop.

SOCIOECONOMIC ASSESSMENT
A socioeconomic analysis will be conducted and released for public review and comment at least 30 days prior to the SCAQMD Governing Board Hearing on PAR 1469, which is anticipated to be heard on February 2, 2018.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings
California H&SC Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.
Necessity
PAR 1469 is needed to further reduce hexavalent chromium emissions from chromium electroplating or chromic acid anodizing operations. PAR 1469 proposes new requirements for hexavalent chromium-containing tanks, such as dichromate seal tanks, that are currently not regulated under Rule 1469. PAR 1469 requires air pollution controls for hexavalent chromium-containing tanks that have the potential to emit hexavalent chromium. In addition, PAR 1469 includes periodic source testing, parameter monitoring of control equipment, requirements for building enclosures, and additional housekeeping and best management practices for all hexavalent chromium-containing tanks. Proposed requirements include triggered provisions for permanent total enclosures vented to air pollution controls based on non-compliance with specific source testing or monitoring requirements. PAR 1469 also revises existing requirements to reduce surface tension limits and prohibit the use of chemical fume suppressants that contain PFOS in order to be consistent with the USEPA NESHAP for Chromium Electroplating.

Authority
The SCAQMD Governing Board has authority to adopt PAR 1469 pursuant to the California Health and Safety Code Sections 39002, 39650 et. seq., 40000, 40440, 40441, 40702, 40725 through 40728, 41508, and 41700.

Clarity
PAR 1469 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency
PAR 1469 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations.

Non-Duplication
PAR 1469 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference
By adopting PAR 1469, the SCAQMD Governing Board will be implementing, interpreting or making specific the provisions of the California H&SC Section 41700 (nuisance), and Federal Clean Air Act Section 112 (Hazardous Air Pollutants) and Section 116 (Retention of State authority).

COMPARATIVE ANALYSIS
H&SC Section 40727.2 requires a comparative analysis of the proposed rule requirements with those of any Federal or District rules and regulations applicable to the same equipment or source category. The comparative analysis will be conducted and released in the draft staff report at least 30 days prior to the SCAQMD Governing Board Hearing on PAR 1469, which is anticipated to be heard on February 2, 2018.
REFERENCES

Air Pollution Control Technology, chapter 21, Ron Roberts, Ventilation Engineer, Lockwood Greene Engineering, Spartanburg, SC.


South Coast Air Quality Management District, April 2003. Staff Report, “Proposed Amended Rule 1469 Hexavalent Chromium Chrome Plating and Chromic Acid Anodizing and Proposed Rule 1426 Emissions From Metal Finishing Operations”.
