SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report

Proposed Amended Rule 1156 – Further Reductions of Particulate Emissions from Cement Manufacturing Facilities

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TABLE OF CONTENTS

List of Tables

EXECUTIVE SUMMARY

Rule 1156 - Further Reductions of Particulate Emissions from Cement Manufacturing Facilities was adopted by the AQMD Governing Board on January 7, 2005. The rule implemented the 2003 Air Quality Management Plan (AQMP) Control Measure BCM-08 of identical title, and was adopted into the State Implementation Plan (SIP) in March 2008. Rule 1156 requires cement manufacturing facilities to comply with specific requirements applicable to various operations, as well as materials handling and transport at the facilities.

Elevated ambient concentrations of hexavalent chromium (hex chrome) in Rubidoux were discovered through the sampling efforts of the Multiple Air Toxic Study III (MATES III). Extensive additional sampling and modeling indicate that these emissions can be traced back to clinker piles stored in the open at TXI Riverside Cement (TXI) located in Riverside. AQMD staff proposes the amendments to Rule 1156 to further reduce particulates, including hex chrome. TXI is one of the two facilities in the AQMD's jurisdiction subject to Rule 1156; the other being California Portland Cement Company located in Colton. Air monitoring around both facilities will continue.

Proposed Amended Rule (PAR) 1156 would require the total enclosure of clinker storage piles regardless of size. While preserving the original intent of the previously adopted rule, staff also proposes minor revisions in PAR 1156 for rule clarification purposes.

PAR 1156 contains two main elements, as summarized below:

Material Storage:
Currently in Rule 1156, operators of a cement manufacturing facility are required to enclose their open storages of clinker if the storage piles exceed 4 acres or 80,000 tons/month throughput. To minimize particulate emissions from clinker piles or piles of any other material that are not fully enclosed, the rule requires the use of dust suppression strategies, such as the application of chemical stabilizer, tarping, and/or providing wind sheltering through the use of barriers/wind fences in conjunction with dust suppression.

Given the finding of AQMD's recent monitoring efforts regarding hex chrome and fine particulates, the proposed amendment would prohibit the open storage of clinker and require operators of cement manufacturing facilities to enclose their clinker storage piles, regardless of size, by March 1, 2009 in order to further reduce particulate matter emissions. The enclosure must also meet the requirements for an air pollution control device.

Exemptions:
Currently, operators of a manufacturing facility can be exempt from storage piles requirement of enclosure or three-sided barrier, or from using the AQMD Rule 403 test methods for the demonstration of a pile's surface stabilization if the materials contained in 90% of the pile's volume are larger than ½ inch.

Under the proposal, this would change to a mass basis and would exclude clinker material. Therefore, operators who have open piles containing only materials other than clinker would

be exempt from the above mentioned requirements if the materials contained in 90% of the pile's mass are larger than ½ inch. The criterion must be achieved through measurement on any composite sample of at least 10 pounds taken at a minimum depth of 12 inches below the pile surface, and at various locations of the pile, but not within 12 inches from the base, to ensure adequate sampling.

Staff will revise the projected emission reductions and cost-effectiveness of PAR 1156 to reflect the enclosure requirement for the clinker piles.

Staff is seeking public comment on the information contained in this preliminary draft staff report.

REGULATORY BACKGROUND

Rule 1156 - Further Reductions of Particulate Emissions from Cement Manufacturing Facilities was adopted by the AQMD's Governing Board on January 7, 2005. The rule was designed to implement the 2003 Air Quality Management Plan (AQMP) Control Measure BCM-08 – Further Emission Reductions from Aggregate and Cement Manufacturing Operations. Rule 1156 requires cement manufacturing facilities to comply with specific requirements applicable to various operations as well as materials handling and transport at the facilities. Rule 1156 was approved by EPA into the SIP in March 2008 and is, therefore, federally enforceable as written.

As AQMD staff completed their data analysis for MATES III, they observed a clear, unexpected upward trend of hex chrome at the Rubidoux monitoring station in Western Riverside County, over two miles to the southwest of TXI. The AQMD's rigorous regulatory and enforcement program should have resulted in a decrease of ambient hex chrome concentration. The hex chrome emissions were unexpected based on information available during the original development of Rule 1156.

AQMD staff has been thoroughly investigating the potential sources of the elevated hex chrome level during the last five months. Staff has been conducting air as well as material and soil sampling, permit reviews, area-wide surveys and surveillance, and air quality modeling. Results indicated that TXI was the source of the elevated hex chrome concentrations in the area. Specifically, the handling and transport of grey clinker material has been determined to be the primary source of hex chrome emissions. Clinker is a product from the kiln which is used as a feedstock to make cement.

To address the issues of hex chrome as a fine particulate and to reduce health risks to the surrounding community, staff is proposing to amend Rule 1156. PAR 1156 would require the total enclosure of clinker storage piles regardless of size, while preserving the original intent of the previously adopted rule.

PUBLIC PROCESS

A Public Workshop is scheduled for July 2, 2008. Approximately 1,000 notices were mailed. Response to comments received will be contained in the final staff report.

AIR QUALITY STANDARDS

The District monitors ambient air quality for criteria pollutants (ozone, carbon monoxide, particulate matter, lead and sulfate) at 32 locations within the Basin. The following table presents a summary of the federal National Ambient Air Quality Standards (NAAQS) and State of California air quality standards for particulate matter. These air quality standards are set to protect public health. The Basin is not in attainment with the 24-hour or annual average NAAQS for PM2.5. The Basin is also not in attainment with State annual average air quality standards for PM2.5.

Table 1
Particulate Matter Concentrations (µg/m^3)

Jurisdiction	PM10		PM2.5	
	Annual	24-Hour	Annual	24-Hour
Annual Average Ambient Concentrations at Rubidoux (Riverside County)*	54.7	--	19.1	--
Federal Standards	--	150	15	35
California Standards	20	50	12	--

* Preliminary figures only

HEALTH EFFECTS FROM FINE PARTICULATE MATTER

The following is an excerpt from Chapter 2, Air Quality and Health Effects, from the 2007 Air Quality Management Plan.

> A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. In recent years, studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.
>
> Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long-term exposure to particulate matter. The elderly, people with pre-existing respiratory and/or cardiovascular disease, and children appear to be more susceptible to the effects of PM10 and PM2.5.

HEALTH EFFECTS FROM HEXAVALENT CHROMIUM

Hex chrome compounds are used in many industries, mainly in chrome plating, and chromate and chromate pigment productions. Studies indicate that exposure to these man-made compounds in the workplace could result in the following:

- Lung cancer;
- Irritation and damage to the skin, eyes, nose, throat, and lung, if exposed to high concentrations;
- Asthma symptoms; or
- Allergic skin reaction such as a red, itchy rash.

Hex chrome compounds are classified as Toxic Air Contaminants by the CARB. The California EPA's (CalEPA) Office of Environment Health Hazard Assessment has established a cancer risk potency factor from breathing in hex chrome at various ambient concentrations. This potency factor can be used to assess cancer risk over a lifetime exposure.

The cancer risk associated with hex chrome from TXI is estimated at 300 to 500 in a million, which is similar to the risk found next to a busy freeway, a rail yard, or a large chrome plating facility. TXI is being required to conduct a facility-wide health risk assessment under the Air Toxics Hotspot Information and Assessment Act, AB 2588.

PURPOSE AND APPLICABILITY

In harmony with ensuring the original intent of Rule 1156, the proposed amendments are designed to further reduce particulate matter emissions from cement manufacturing facilities, in order to aid in progress towards attainment of the federal and state standards, and health protection from the emissions of fine particulates (including hex chrome).

PAR 1156 would strengthen the requirements for clinker storage at cement manufacturing facilities.

LEGAL AUTHORITY

The AQMD obtains authority to adopt, amend, or repeal rules and regulations which control air pollution from Health and Safety Code Sections 39002, 40000, 40001, and 40440.

AFFECTED INDUSTRY

There are two facilities subject to PAR 1156: California Portland Cement located in Colton (south-western San Bernardino County), and TXI located in Riverside (north-western Riverside County). The rule amendments would not increase the number of facilities subject to the rule, but would make existing requirements more stringent.

SUMMARY OF PROPOSED RULE

PAR 1156 is summarized below.

Subdivision (d) – Requirements

Material Storage:
Operators of a cement manufacturing facility would be required to enclose clinker storage piles, regardless of size, by March 1, 2009 (subparagraph (d)(5)(B)) in order to further reduce particulate matter emissionss. The enclosure must also meet the requirements for an air pollution control device.

Language has been modified to clarify that the opacity standards in subparagraphs (d)(1)(A) and d(1)(B) are equal to or greater than (not just greater than) 10% and 20% respectively. Subparagraph (d)(2)(B) has also been revised to clarify that during all conveying activities, the enclosed transfer points and enclosed conveying systems must be vented to a permitted and operated control equipment that meet the required standards.

Subdivision (h) - Exemptions

Operators who have open piles containing materials other than clinker would be exempt from the storage piles requirement of enclosure or three-sided barrier, or from using the AQMD Rule 403 test methods for the demonstration of pile's surface stabilization if the materials contained in 90% of the piles' mass (instead of volume) are larger than ½ inch (paragraph (h)(1)). The criterion must be achieved through measurement on any composite sample of at least 10 pounds taken at a minimum depth of 12 inches below the pile surface, and at various locations of the pile, but not within 12 inches from the base, to ensure adequate sampling. This change is being proposed to better provide guidance on sampling and to improve the effectiveness of the exemption.

EMISSION REDUCTIONS

Staff will estimate potential emission reductions resulting from the proposal.

COST-EFFECTIVENESS

According to the Rule 1156 Final Staff Report dated November 4, 2005, the cost-effectiveness for the installation of a 1-acre dome was estimated to be approximately $2 millions/acre or $6,400/ton of PM reduced. The cost-effectiveness of PAR 1156 will be re-evaluated to reflect the enclosure requirement for clinker piles, regardless of size.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD) is the Lead Agency for the project identified above pursuant to its certified regulatory program (SCAQMD Rule 110). The objective of PAR 1156 is to require the enclosure of clinker at cement manufacturing facilities. A Final Environmental Assessment (EA) (SCAQMD No. 050307JK, dated October 13, 2005) was previously prepared pursuant to the California Environmental Quality Act, which identified "air quality" as the only environmental topic that might be adversely affected by the current

rule. Alternative C of the same Final EA proposed to enclose all active storage piles. Since enclosing clinker at cement manufacturing facilities would be a subset of enclosing all active storage piles, the environmental impacts of the proposed project would be within the scope of the analysis disclosed in Alternative C of the Final EA. Since the currently proposed project was analyzed, as an alternative in the previous Final Environmental Assessment that was circulated for public review and comment, and subsequently certified (SCAQMD No. 050307JK, dated October 13, 2005), SCAQMD will rely on that previously certified Final EA pursuant to CEQA Guidelines §15153, because the circumstances of the projects are essentially the same. A Notice to Rely will be circulated and the Final EA will be made available for public review and comment on the environmental analysis.

SOCIOECONOMIC ASSESSMENT

Staff will conduct a socioeconomic assessment on the final proposal for public review, which will be available 30 days prior to the public hearing.

DRAFT FINDINGS

Health and Safety Code Section 40727 requires the AQMD to adopt written findings of necessity, authority, clarity, consistency, non-duplication and reference.

Necessity
A need exists to amend Rule 1156 to implement the original intent of the rule pursuant to California Health & Safety Code Sections 40923. The objective of the proposed amendment would preserve the original intent of Rule 1156 by ensuring that fugitive dust emissions from the storage and handling of clinker are minimized.

Authority
The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from California Health & Safety Code Sections 39002, 40000, 40001, 40702, and 40725 through 40728, inclusive.

Clarity
The proposed amended rule has been written or displayed so that its meaning can be easily understood by persons directly affected by it.

Consistency
The proposed amended rule is in harmony with and not in conflict with or contrary to, existing statues, court decisions or state or federal regulations.

Non-Duplication
The proposed amended rule does not impose the same requirements as any state or federal regulations. The amendment is necessary and proper to execute the powers and duties granted to, and imposed upon, AQMD.

Reference
By adopting the proposed amended rule, the AQMD Governing Board will be implementing, interpreting, and making specific the provisions of the California Health & Safety Code Section 40001 (rules to achieve ambient air quality standards).

ALTERNATIVE CONTROL MEASURES

Health and Safety Code Section 40440.5, subsection (c)(3) requires an analysis of alternative control measures. Staff will conduct such an analysis for public review, and is seeking input.

COMPARATIVE ANALYSIS

Health and Safety Code §§40727.2 requires a written analysis comparing a proposed rule or amendment with existing federal, State and District regulations. Health and Safety Code §§40727.2, subsection (c) and (d) further require the analysis to review averaging provisions, operating parameters, work practice requirements, and monitoring, reporting and recordkeeping requirements associated with existing applicable rules and proposed regulations. A comparative analysis for the adoption of Rule 1156 in 2005 was conducted and is included on the following pages. The comparison analysis will be updated to reflect the final staff proposal.

Table 2 - Comparison between PR1156, NSPS 40 CFR Part 60 Subpart F, NESHAP 40 CFR Part 63 Subpart LLL, and Compliance Assurance Monitoring 40 CFR Part 64 Requirements

RULE 1156	AQMD RULE 1112.1	NSPS -- 40CFR PART 60 SUBPART F	NESHAP -- 40 CFR PART 63 SUBPART LLL	COMPLIANCE ASSURANCE MONITORING 40CFR PART 64
APPLICABILITY				
Equipment/Operation: Kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, conveyor transfer points, bagging, bulk loading and unloading systems; and operations that generate fugitive dusts.	Equipment/Operation: Cement kiln and clinker cooler for dry-process manufacturing of gray cement.	Equipment/Operation: Kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, conveyor transfer points, bagging and bulk loading and unloading systems • Equipment constructed or modified after 7/17/1971.	Facility is a major source or area source of air toxics; Equipment/Operation: Kiln, clinker cooler, raw mill system, finish mill system, raw mill dryer, raw material storage, clinker storage, conveyor transfer points, bagging and bulk loading and unloading systems • Existing equipment or equipment constructed or reconstructed after 9/11/1998.	Equipment that: • is subject to emission standard (e.g. SIP approved rules but not 40 CFR Part 60 or Part 63 rules); • uses a control device, and • 3) has pre-control emissions that are equal to or more than the major source threshold (e.g. 70 tpy PM10)
COMPLIANCE DATE				
By December 2006. Facility Emissions Reduce 2003 baseline emissions by 50% by 2006.	On and after February 1986.	On or after completion of the initial performance test.	• For existing equipment: 6/14/2002 • For new or modified equipment: Upon startup	If the Title V application is complete before 4/20/1998, a CAM plan is due as part of the application for the Title V permit renewal, or as part of the application for a significant permit revision.

RULE 1156	AQMD RULE 1112.1	NSPS -- 40CFR PART 60 SUBPART F	NESHAP -- 40 CFR PART 63 SUBPART LLL	COMPLIANCE ASSURANCE MONITORING 40CFR PART 64
PERFORMANCE STANDARDS				
<u>All Equipment</u> Opacity ≤ 10% <u>Kilns and Clinker Coolers</u> PM10 ≤ 0.05 lb/ton clinker <u>All Baghouses</u> Outlet concentration ≤ 0.005 grain/dscf ; or 99.5% capture efficiency and 99.5% collecting efficiency <u>Other Equipment</u> • Opacity ≤ 10% process equipment via method 9 • Opacity < 20% open piles & roadways via method 9B • Visible emissions not to exceed 100 ft. plume in any direction <u>Other Requirements</u> • Enclosed storage piles, crushers, screens, mills, conveying systems, and other equipment. • Pave roads, use chemical dust suppressants, limit vehicle speed, street sweeping, and facility cleanup.	<u>Kilns and Clinker Coolers Combined</u> • PM ≤ 0.4 lb/ton feed when kiln feed rates <75 ton/hr • PM ≤ 30 lb/hr when kiln feed rates >75 ton/hr	<u>Kilns</u> • PM ≤ 0.3 lb/ton feed dry basis • Opacity ≤ 20% <u>Clinker Coolers</u> • PM ≤ 0.1 lb/ton feed dry basis • Opacity ≤ 10% <u>Other Equipment</u> Opacity ≤ 10%	<u>Kilns:</u> • PM ≤ 0.3 lb/ton feed dry basis • Opacity ≤ 20% <u>Clinker Coolers</u> • PM ≤ 0.3 lb/ton feed dry basis • Opacity ≤ 10% <u>Other Equipment</u> Opacity ≤ 10% <u>Other Requirements</u> THC < 50 ppmvd as propane corrected to 7% oxygen D/F <8.7 x 10^{-11} grain/dscf corrected to 7% oxygen	Not specified performance standards.

RULE 1156	AQMD RULE 1112.1	NSPS -- 40CFR PART 60 SUBPART F	NESHAP -- 40 CFR PART 63 SUBPART LLL	COMPLIANCE ASSURANCE MONITORING 40CFR PART 64
MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS				
• Annual source testing for kilns and clinker coolers • Source test at least 10 equipment vented to baghouses which are in the top 20% PM10 emitters at the facility. • Monitor operating parameters of baghouses such as flue gas flow rates and pressure drop across filters. • Keep all records to demonstrate compliance for at least 5 years. • Report annual emissions for all process equipment, open storage piles and vehicle traffic. • Source Test Methods: AQMD Method 5.1, 5.2, 5.3 or EPA Method 5 modified; or EPA Method 201A and 202 for PM10.	Not specify.	• Continuous opacity monitoring for kilns and clinker coolers and any bypass • Record visible emissions at least three 6-minute periods each day, and records maintained for 2 years. • Record daily production rates and kiln feed rates • Initial performance test is required to be conducted. • Excess emissions must be reported semi –annually. • Malfunctions must be reported. • Semiannual report of excess emissions and malfunctions • Source Test Methods: EPA Method 5 for PM and Method 9 for opacity.	• Initial performance test is required to determine compliance with the emission limitation and to establish the operating limits • Performance test is required every 30 months – 5years • Source Test Methods: EPA Method 5 for PM and Method 9 for opacity.	A CAM plan accompanying a Title V permit must: • Describe indicators to be monitored; • Describe indicators' ranges; • Describe performance criteria for monitoring; • Provide justification for the use of the indicators, ranges, and monitoring approach; • Provide emission test data, if necessary; and • Provide an implementation plan. A Title V permit must: • Include approved monitoring approach, • Have specific definitions of exceedence or excursion; • Include reporting and recordkeeping requirements; and • Indicate if source testing is required. Source Test Methods: Not specified.

CONCLUSION

PAR 1156 would further reduce particulate emissions through the enclosure of clinker piles, regardless of size. PAR 1156 would, as a result of the amended requirements, also reduce hex chrome fugitive dust emissions.

REFERENCES

AQMD, 2004. Final Staff Report on Proposed Rule 1156 - Further Reductions of Particulate Emissions from Cement Manufacturing Facilities. November 2004.

AQMD, 2008. Attachment 1 from Dr. Barry W. Wallerstein's letter to the public dated May 6, 2008.

RESPONSE TO COMMENTS

Comments received during the public workshop held July 2, 2008 and comment period which ends July 18, 2008 will be responded to in the staff report.