



Supplemental Document

Clean Air Act Subpart 4:

The 2012 PM_{2.5} Plan
for the 2006 PM_{2.5}
Standard and District
Rule 2201 (New and
Modified Stationary
Source Review)



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Supplemental Document: Clean Air Act Subpart 4 Requirements

This document demonstrates that the San Joaquin Valley Unified Air Pollution Control District's (District) adopted *2012 PM_{2.5} Plan*¹ satisfies federal PM_{2.5} plan requirements under subpart 4 of Part D of Title I of the Clean Air Act (CAA) (referenced herein as subpart 4). Additionally, this supplemental document also demonstrates that Valley attainment of the 2006 PM_{2.5} standard by 2015 is not practicable. As such, the District requests the U.S. Environmental Protection Agency (EPA) approve the already submitted *2012 PM_{2.5} Plan* and reclassify the San Joaquin Valley air basin (Valley) as a serious nonattainment area. Finally, this document demonstrates that the District's most recently adopted Rule 2201, New and Modified Stationary Source Review² (adopted April 21, 2011) fully satisfies the requirements of subpart 4.

1 BACKGROUND

The District adopted its *2012 PM_{2.5} Plan* on December 20, 2012 to satisfy requirements from EPA's 2007 Fine Particle Implementation Rule³, which was grounded in subpart 1 of the CAA. However, weeks later, in January 2013, the D.C. Circuit Court⁴ found that EPA erred in implementing federal PM_{2.5} standards pursuant solely to the general implementation provisions of CAA subpart 1 of Part D of Title I without also considering the particulate matter-specific provisions of subpart 4 of Part D (subpart 4). As a result, on June 2, 2014, EPA classified the Valley (and all other PM_{2.5} nonattainment areas) as "moderate" under subpart 4.⁵ EPA must evaluate the District's *2012 PM_{2.5} Plan* under subpart 4 for the CAA, per the court ruling.

CAA subpart 1 provides general guidance for nonattainment areas, while CAA subpart 4 provides additional provisions for particulate matter nonattainment areas. The following is a comparison of requirements air districts must comply with pursuant to subpart 4 requirements versus analogous requirements in subpart 1. Requirements specific to subpart 1 that have no analogous requirement in subpart 4 will not be included in this summary because this supplemental document is specific to subpart 4 requirements. While subpart 4 requirements are specific to PM₁₀, the court has ruled that subpart 4 applies equally to PM_{2.5}, and so the references below refer to PM_{2.5}, the subject of this document.

¹ SJVUAPCD. *2012 PM_{2.5} Plan*. Retrieved on 5/5/14 from

http://www.valleyair.org/Air_Quality_Plans/PM25Plans2012.htm

² SJVAPCD. Rule 2201 (New and Modified Stationary Source Review Rule). Retrieved on 7/15/2014 from

http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2011/April/Agenda_Item_8_Apr_21_2011.pdf.

³ EPA. 40 CFR Part 51. *Clean Air Fine Particle Implementation Rule; Final Rule*. (20586 – 20667) April 25, 2007.

Retrieved on 5/5/14 from <http://www.epa.gov/fedrgstr/EPA-AIR/2007/April/Day-25/a6347.pdf>.

⁴ Natural Res. Def. Council v. E.P.A., 706 F.3d 428, 430 (D.C. Cir. 2013)

⁵ EPA. 79 Fed. Reg. 105, pp. 31566-31782. *Identification of Nonattainment Classification and Deadlines for Submission of State Implementation Plan Provisions for the 1997 Fine Particle (PM_{2.5}) National Ambient Air Quality Standard (NAAQS) and 2006 PM_{2.5} NAAQS*, codified at 40 CFR Chapter 1. Retrieved 7/21/2014 from <http://www.gpo.gov/fdsys/pkg/FR-2014-06-02/pdf/2014-10395.pdf>.

Classification and Reclassification

- *Subpart 1:* EPA may classify nonattainment areas, but is not required to (CAA §172(a)(1)).
- *Subpart 4:* All areas designated nonattainment for PM_{2.5} are classified as Moderate nonattainment by order of law (CAA §188(a)).
 - Moderate nonattainment areas can be reclassified to Serious nonattainment (CAA §188(b)) under the following conditions:
 - If the area shows it cannot reasonably attain the standard by the deadline associated with the Moderate nonattainment classification, it can be reclassified before the attainment date.
 - If a Moderate nonattainment area fails to attain the standard by the Moderate nonattainment attainment date, then the area shall be reclassified as Serious nonattainment.

Attainment Dates

- *Subpart 1:* Five years from the date of designation (CAA §172(a)(2)).
 - The attainment date may be extended up to 10 years from date of designation and (2) 1-year extensions may be issued.
- *Subpart 4:* (CAA §188(d & e))
 - Moderate nonattainment areas have an attainment deadline of the end of the sixth calendar year after designation.
 - Up to two 1-year extensions are available to each Moderate nonattainment area without reclassification to Serious nonattainment.
 - Serious nonattainment areas have an attainment deadline of the end of the tenth calendar year after designation.
 - One extension of up to five years is available if the attainment deadline is unfeasible and the state complies with all requirements and commitments, and the state implementation plan (SIP) includes the most stringent measures practicable.

Plan Submissions Deadlines

- *Subpart 1:* Plans due three years after designation
- *Subpart 4:*
 - Moderate nonattainment areas must submit a plan within 18 months after nonattainment designation.
 - Serious nonattainment areas must submit a plan containing best available control measures at 18 months and a full attainment plan no later than four years after reclassification to Serious; however, areas reclassified under CAA §188(b)(2) must submit the attainment demonstration within 18 months after reclassification to Serious.
 - If an area fails to attain, that area must submit SIP revisions to EPA within 12 months of the failed attainment date that demonstrates attainment and an annual 5% reduction of PM_{2.5} or PM_{2.5} precursors.

Level of Emissions Controls

- *Subpart 1:* Reasonably Available Control Measures (RACM) must be implemented as soon as practical
- *Subpart 4:*
 - Moderate nonattainment areas must implement RACM within 4 years of designation.
 - Serious nonattainment areas must implement Best Available Control Measures (BACM) within 4 years after the area is classified as Serious nonattainment.
 - EPA will issue RACM and BACM guidance for urban fugitive dust, residential wood combustion, and prescribed silviculture and agriculture burning (CAA §190)

Precursor Requirement Presumptions and RACM

- *Subpart 1:* Areas are not required to address sources of ammonia and VOCs, unless it is technically demonstrated that ammonia or VOC significantly contributes to PM_{2.5} concentrations in the area (EPA Implementation Rule).
- *Subpart 4:* Areas must address sources of ammonia and VOCs for RACT and other areas of the plan, unless the state demonstrates that such sources do not significantly contribute to PM_{2.5} exceedances in the area (CAA §189(e)).

Permitting program

- *Subpart 1:*
 - An area needs a permitting program that meets CAA §173 for PM₁₀ new and modified major stationary sources.
 - An area is not required to address sources of ammonia and VOCs, unless EPA or the state technically demonstrates that ammonia or VOC significantly contributes to PM_{2.5} concentrations in the area (EPA Implementation Rule).
- *Subpart 4:*
 - A Moderate nonattainment area needs a permitting program that meets CAA §173 (in Subpart 1) for new and modified major PM_{2.5} stationary sources (CAA §189(a)(1)(A)).
 - A Serious nonattainment area must change the definition of Major Sources to include a stationary source or any group of stationary sources with a potential to emit of at least 70 tons per year of PM_{2.5} (CAA §189(b)(3)).
 - Major stationary sources must address precursors of PM_{2.5}, unless the state demonstrates that such sources do not significantly contribute to levels that exceed the standard (CAA §189(e)).

Available Waivers

- *Subpart 1:* No analogous waivers are available in Subpart 1 as allowed in Subpart 4.
- *Subpart 4:*
 - No available waivers for a Moderate nonattainment area.
 - For a Serious nonattainment area, EPA may waive any Subpart 4 requirement (including a specific date for the attainment deadline) if

anthropogenic PM_{2.5} sources do not contribute significantly to PM_{2.5} violations. (CAA §188(f)).

This supplemental document addresses the five aspects of PM_{2.5} implementation where of Subpart 4 differs from Subpart 1 for the Valley:

1. Attainment Date
2. Reasonably Available Control Measures
3. Reasonable Further Progress
4. Contingency Measures
5. New Source Review Program

2 ATTAINMENT DATE

Pursuant to subpart 4 Section 188(c)(1), the attainment date for a moderate area shall be as expeditiously as practicable but no later than the end of the sixth calendar year after the area's designation, unless EPA determines that the moderate area cannot practicably attain the NAAQS by the attainment date and reclassifies the area as a serious nonattainment area (serious area). For a serious area, the attainment date shall be as expeditiously as practicable, but no later than the end of the tenth calendar year after designation.

The Valley was designated nonattainment for the 2006 PM_{2.5} standard in 2009⁶; therefore, the attainment date for the Valley as a moderate area is 2015. The following discussion will substantiate that the District assessed the feasibility of attainment by 2015 in the *2012 PM_{2.5} Plan* and determined attainment by this date is not practicable and as such demonstrates the necessity of EPA to reclassify the Valley as a serious area.

2.1 Valley Attainment of the 2006 Standard by 2015 Is Not Practicable

The *2012 PM_{2.5} Plan* addresses the 2015 attainment date in Chapter 9 as a part of the analysis to determine the most expeditious timeline in which the Valley can attain the standard. The analysis confirms that attainment of the 2006 standard by 2015 is not practicable.

Photochemical modeling and other technical analyses establish an emissions level at which the Valley would attain the federal 24-hour PM_{2.5} standard. Given the significant contribution of ammonium nitrate to the Valley's PM_{2.5} concentrations, reductions in NO_x emissions are particularly important. To achieve the NO_x reductions critical for reaching attainment in the Valley, ARB has adopted regulations that will significantly reduce NO_x emissions from various mobile sources. Achieving this level of emissions reductions requires adequate time and carries a tremendous cost. These reductions

⁶ EPA. 40 CFR Part 81. *Air Quality Designations for the 2006 24-Hour Fine Particle National Ambient Air Quality Standards*. (58688-58781) November 13,2009. Retrieved on 5/5/14 from <http://www.gpo.gov/fdsys/pkg/FR-2009-11-13/pdf/E9-25711.pdf>.

are ultimately achieved in time to bring most of the Valley into attainment well before 2019, with the exception of Bakersfield.

All areas of the Valley will attain the standard in 2019 with the regulatory controls in the *2012 PM_{2.5} Plan*. Kern County is projected to be the last portion of the Valley to attain, and is thus the area with the most need for additional emissions reductions through the *2012 PM_{2.5} Plan*. In order for Bakersfield to attain by 2015, an additional 11.8 tons per day (tpd) of NO_x reductions (as well as an additional 0.4 tpd of PM_{2.5} reductions) would be needed in Kern County by 2015 (see Table 1). To put this in perspective, achieving this level of emissions reductions is equivalent to virtually eliminating all passenger vehicles AND 75% of stationary source NO_x emissions in Kern County next year (2015).

The District's "no stone unturned" evaluation of emissions sources and emissions controls did not reveal any additional reasonably available emissions reductions opportunities that provide for attainment in 2015. All new control strategies are scheduled for implementation by 2017. The District intends to amend Rule 4692 (Commercial Charbroiling) in 2016 with implementation in 2017. Rule development cannot be expedited for this measure because time is needed for continued research and technology demonstration projects, which the District is actively facilitating⁷. The District also committed in the *2012 PM_{2.5} Plan* to amend Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) in 2016. District Rule 4901 is already amongst the most stringent rules for this source category, and expediting this rule alone would not be enough to accelerate attainment. That said, the District is working to amend this rule early, with implementation in 2014.

Thus, the *2012 PM_{2.5} Plan's* 2019 attainment year demonstration also illustrates that attainment by 2015 is not practicable, supporting a request for reclassification to serious.

⁷ See the District's Restaurant Charbroiler Technology Partnership program: <http://www.valleyair.org/grants/content/rctp.html>

Table 1 Kern County Attainment Outlook (tons per day)

Ref#		2007 base year	2015	2016	2017	2018	2019
1	Winter PM2.5 emissions inventory, reflecting adopted control measures	15.4	11.5	11.4	11.4	11.4	11.4
2	New control measure commitments		0	0.1	0.3	0.3	0.3
3	Winter PM2.5 emissions inventory reflecting full plan control strategy (Line 1 – Line 2 above)		11.5	11.3	11.1	11.1	11.1
4	Direct PM2.5 Attainment Target		11.1				
5	Winter NOx emissions inventory, reflecting full plan control strategy	115.4	58.6	54.5	51.5	48.9	46.8
6	NOx Attainment Target		46.8				
7	Winter SOx emissions inventory, reflecting full plan control strategy	3.6	1.8	1.8	1.8	1.8	1.8
8	SOx Attainment Target		1.8				
<i>Attainment?</i>			No	No	No	No	Yes
Projected attainment year			2019				

2.2 Reclassification from Moderate Area to Serious Area

Pursuant to subpart 4 Section 188(b) a moderate area may be reclassified for one of the following two circumstances:

1. Before the Attainment Date: Any moderate area that EPA determines cannot practicably attain the NAAQS by the attainment date.
2. Upon Failure to Attain: Any moderate area that EPA finds is not in attainment after the applicable attainment date shall be reclassified by operation of law as a serious area.

As discussed above, attainment by the moderate deadline of 2015 is not practicable, so the Valley should be reclassified as a serious nonattainment area. For a serious area, the attainment date shall be as expeditiously as practicable but no later than the end of the tenth calendar year; therefore, should the Valley be redesignated as a serious area, the latest attainment deadline would be 2019. The District would demonstrate an

appropriate attainment year in a new attainment plan satisfying serious area requirements upon EPA reclassification to serious.

3 REASONABLY AVAILABLE CONTROL MEASURES (RACM)

3.1 Subpart 4 requirements for RACM

Subpart 4 Section 189(a)(1)(C) states that moderate area SIPs must demonstrate that reasonably available control measures (RACM) must be in place within four years of its nonattainment designation. Areas classified serious must implement best available control measures (BACM) (Section 189(b)(1)(B), but as the Valley is currently classified as moderate, BACM will be addressed in a future plan. The subpart 4 RACM requirement is satisfied by section 9.2 of the *2012 PM2.5 Plan*, and is summarized below.

For a plan demonstrating the impracticability of attainment by the moderate area deadline, “EPA believes it is reasonable for all available control measures that are technologically and economically feasible to be adopted for areas that do not demonstrate attainment. ... EPA anticipates that any future implementation of BACM for these sources will be additive to, and hence compatible with, RACM.”⁸

RACM are, by definition, reasonable. Although an air quality attainment plan must include a thorough analysis of reasonably available measures, it need not analyze every conceivable measure; reasonability must drive the analysis. Any measure that is absurd, unenforceable, impractical, or would cause severely disruptive socioeconomic impacts is unreasonable. This analysis must consider all agencies’ opportunities together, but the starting point is the separate analyses of each agency.

As discussed in Section 2.0 above, the District is adopting reasonably available control measures as expeditiously as practicable. Furthermore, most of the nation’s most stringent controls are already in place in the Valley. This is demonstrated in great detail in Chapter 5 and Appendices C and D of the District’s *2012 PM2.5 Plan*, and summarized below. There are no reasonable regulatory control measures excluded from use in the plan; therefore, there are no emissions reductions associated with unused regulatory control measures.

3.2 NOx and PM

Although NOx and directly emitted PM2.5 emissions are key to attaining the NAAQS and commitments were made to amend NOx and PM2.5 specific rules in the plan, adopting amendments to these rules earlier than committed to in the *2012 PM2.5 Plan* will not get the District into attainment before the 2015 deadline assigned to moderate areas.

⁸ General Preamble to the CAA, 57 FR 13544.

Specifically, the 2012 *PM2.5 Plan* committed to amend District Rules 4901 (Wood Burning Fireplaces and Wood Burning Heaters) and Rule 4692 (Commercial Charbroiling), both in 2016. The District's Board directed staff to amend Rule 4901 in 2014 based on the District's Health Risk Reduction philosophy. Rule 4901 is in the process of undergoing the public amendment process this year and is expected to be taken to the Governing Board for public hearing in the third quarter of 2014, with a plan emission reductions commitment of at least 1.5 tpd of PM2.5. However, the federally-enforceable commitment for Rule 4901 remains as implementation in 2016. While early adoption of Rule 4901 amendments will provide important public health benefits, it would not accelerate PM2.5 attainment since time is needed to fully implement the adopted mobile source regulations that achieve critical NOx emissions reductions for 2019 attainment.

Rule 4692 is scheduled for amendment in 2016 because the technology has not been proven feasible to require yet. The SCAQMD and District have been working together to demonstrate potential technologies in a controlled setting and are now moving forward to demonstrate control technologies in real-world settings in Valley restaurants. The 2016 timeline will allow for technologies to be proven feasible and to become commercially available. The amendments to this rule will reduce emissions by 0.4 tpd of PM2.5.

3.3 Ammonia

3.3.1 Ammonia Contribution to PM_{2.5} Concentrations

The switch from CAA subpart 1 to subpart 4 for PM_{2.5} implementation shifts the precursor presumption for planning purposes. Under EPA's original PM_{2.5} implementation rule (based on CAA subpart 1), regions were not required to address ammonia unless technical demonstration shows that ammonia reductions contribute to PM_{2.5} attainment. Now, under subpart 4, regions are required to address ammonia as a precursor unless EPA determines that ammonia sources do not contribute significantly to PM concentrations. The starting presumption has thus changed, but scientific evaluation can still override that presumption. In the Valley, there is extensive scientific research and technical analysis demonstrating that ammonia reductions do not contribute to PM_{2.5} attainment. As such, the Valley's ammonia emissions do not need to be reduced to address EPA's PM_{2.5} standard.

The role of ammonia in the Valley's PM_{2.5} concentrations is discussed in detail in Chapter 4 of the *2012 PM_{2.5} Plan*, and is summarized here. Early air quality research in the Valley identified ammonium nitrate (nitrate) as a predominant secondary PM_{2.5} species in the region, with high concentrations forming during the winter months.⁹ Studies have continued to show that ammonium nitrate is a primary component of wintertime PM_{2.5} in the Valley, followed by other species, such as organic carbon, ammonium sulfate, and geologic material.¹⁰ In addition, PM_{2.5} speciation data, collected for many years at four Valley urban monitoring locations, also shows nitrate's substantial contribution to the Valley's total PM_{2.5} concentrations, especially on days when the 24-hour average concentration exceeds the 35 µg/m³ 24-hour PM_{2.5} standard.

Nitrate buildup is a signature outcome of multi-day stagnation periods during the winter (similar buildup is not observed during warmer seasons). The modeled regional variation of nitrate concentrations is shown in Figure 4-2 of the *2012 PM_{2.5} Plan*. Higher concentrations of nitrate occur in the southernmost Valley as a result of slower wind speeds and higher levels of reactive nitrogen and ammonia.

Both nitric acid and ammonia are needed to form ammonium nitrate. The extensive research conducted through CRPAQS and subsequent studies, as well as ongoing evaluation and modeling demonstrates that there is a relative abundance of ammonia (NH₃) compared to nitric acid (HNO₃), and that the amount of nitric acid (resulting from NO_x emissions) drives the ultimate formation of ammonium nitrate. Figure 4-3 of the *2012 PM_{2.5} Plan* illustrates this ammonia abundance at the rural Angiola (Fresno County) air monitoring site in the Valley during the CRPAQS field study. Ammonia

⁹ Smith, T.B.; Lehrman, D.E.; Reible, D.D.; and Shair, F.H. (1981). The origin and fate of airborne pollutants within the San Joaquin Valley: Extended summary and special analysis topics. Report No. 2. Prepared for the California Air Resources Board, and by the California Institute of Technology, Pasadena, CA.

¹⁰ Ying, Q. & Kleeman, M.J., (2009). Regional Contributions to Airborne Particulate Matter in Central California during a Severe Pollution Episode. *Atmospheric Environment*, 43, 1218–1228.

concentrations are considerably higher than nitric acid concentrations throughout the Valley, including urban areas with concentrated NO_x emissions.¹¹

Because of the regional surplus in ammonia, even substantial ammonia emissions reductions yield a relatively small reduction in nitrate. Figures 4-4 and 4-5 of the *2012 PM_{2.5} Plan* provide a simplified illustration of this situation. As seen in Figure 4-6 of the *2012 PM_{2.5} Plan*, a comparable modeling analysis based on CRPAQS observational data found a higher disparity between the efficiency of NO_x versus ammonia controls. Reductions in nitrate concentrations of 30% to 50% were realized through a 50% reduction in NO_x, while a 50% reduction in ammonia only realized less than 5% reductions in nitrate concentrations. Finally, Figure 4-7 of the *2012 PM_{2.5} Plan* provides clear correlative evidence from observed data that NO_x controls are effectively reducing ammonium nitrate, despite an increase in the regional ammonia inventory over the same time period.

Due to this extensive body of science that clearly shows the much greater efficacy of reducing NO_x emissions relative to ammonia, ammonia reductions have not historically been considered a significant precursor to PM_{2.5} formation in the Valley. However, the District and ARB have continued to examine the potential role of ammonia with regard to PM_{2.5} formation (see Appendices F and G of the *2012 PM_{2.5} Plan*).

The modeling sensitivity analysis conducted for the *2012 PM_{2.5} Plan* shows that reductions in ammonia emissions achieve insignificant reductions in the 2019 PM_{2.5} design values compared to reductions of direct PM_{2.5} and NO_x emissions. As Appendix G of the *2012 PM_{2.5} Plan* details:

- A 1 ton reduction in the Valley's total direct PM_{2.5} emissions reduces the Bakersfield-California PM_{2.5} design value by 0.34 µg/m³
- A 1 ton reduction in the Valley's total NO_x emissions reduces the Bakersfield-California PM_{2.5} design value by a 0.08 µg/m³
- A 1 ton reduction in the Valley's total ammonia emissions reduces the Bakersfield-California PM_{2.5} design value by a mere 0.008 µg/m³

Relative to the other pollutants, ammonia emission reductions at the Bakersfield-California site are only 2.3% as effective as directly emitted PM_{2.5} emission reductions, and only 10% as effective as NO_x emission reductions.

Furthermore, it would take an unreasonable tonnage of ammonia reductions to reduce a significant amount of PM_{2.5} mass. Since, as noted above, 1 ton of reduction in ammonia achieves a 0.008 µg/m³ reduction in the PM_{2.5} design value, it would take a total ammonia reduction of 125 tons per day for the Valley to achieve only a 1 µg/m³ reduction in the PM_{2.5} design value. Based on the total ammonia emissions inventory for the Valley in the year 2019, this would equate to a 34% reduction of the total tonnage. Thus, current technical analyses demonstrate that ammonia reductions would

¹¹ Magliano, K. L. (2009) Science-Based Policies for Particulate Matter Air Quality Management in California. *International Aerosol Modeling Algorithms Conference*. Davis CA.

not significantly contribute to the Valley's attainment of the 2006 PM_{2.5} standard, so sources of ammonia emissions were not evaluated under the *2012 PM_{2.5} Plan*.¹²

Based on 2018 emissions and analysis, as discussed in the *2012 PM_{2.5} Plan*, the District estimates the 2018 design value for Bakersfield-California is at least 1 µg/m³ higher than the attainment level. It would take at least 125 tons of additional ammonia emissions reductions to advance attainment by one year. As discussed in Chapter 5 of the *2012 PM_{2.5} Plan*, this is an infeasible amount of emissions reductions for ammonia.

Nationwide, as regions continue to look into the issue of ammonia as a PM_{2.5} precursor, research should continue to assess the relationship between ammonia emissions and ambient PM_{2.5} emissions. Ammonia control measures should only be required if additional ammonia reductions are found to be needed to meet health-based air quality standards.

3.3.2 Ammonia Controls

As noted in section 3.3.1, under subpart 4, regions are required to address ammonia as a precursor in RACT analyses and other areas of the plan unless EPA determines that ammonia sources do not contribute significantly to PM concentrations. To improve public health while also ensuring effective use of resources, additional ammonia controls should only be required when there is clear scientific evidence that reasonable measures to reduce ammonia emissions would be effective in significantly reducing ambient PM_{2.5} concentrations.

Extensive scientific research and technical analysis described above (and more extensively in the *2012 PM_{2.5} Plan*) demonstrates that ammonia reductions do not contribute to the Valley's PM_{2.5} attainment. That said, this section shows that the Valley's ammonia emissions have been significantly reduced through stringent District regulations. This section also shows that additional ammonia reductions are infeasible. Because the science indicates that ammonia reductions do not contribute to the Valley's PM_{2.5} attainment, and because additional ammonia controls are infeasible, the Valley's ammonia emissions do not need to be further reduced to address EPA's PM_{2.5} standard.

As demonstrated in Appendix B of the *2012 PM_{2.5} Plan*, the three main sources of ammonia emissions in the Valley from stationary and area sources account for 96% of the Valley's ammonia emissions and are as follows (based on 2015 estimates):

- Farming Operations with 239.2 tons per day (tpd),
- Solvent evaporation from Agricultural Fertilizers at 66.1 tpd, and
- Composting Solid Waste Operations at 20.5 tpd.

¹² Clean Air Fine Particle Implementation Rule [PM_{2.5} Implementation Rule]. 72 Fed. Reg. 79, pp. 20586–20667 at p. 20590 (2007, April 25). Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2007-04-25/pdf/E7-6347.pdf#page=1>

Attachment A of this document presents a detailed evaluation of:

- Confined Animal Facilities (District Rule 4570)
- Agricultural Fertilizers
- Organic Material Composting (District Rule 4566)
- Biosolids, Animal Manure, and Poultry Litter Operations (District Rule 4565)
- Major Sources of Ammonia

Based on this analysis and the analysis summarized in section 3.3.1, there are no additional ammonia controls the District could adopt that would advance PM_{2.5} attainment.

3.4 VOCs

3.4.1 VOC Contribution to PM_{2.5} Concentrations

As discussed in the ammonia section above, the switch from CAA subpart 1 to subpart 4 for PM_{2.5} implementation shifts the precursor presumption for planning purposes. Under EPA's original PM_{2.5} implementation rule (based on CAA subpart 1), regions were not required to address VOCs unless technical demonstration shows that ammonia reductions contribute to PM_{2.5} attainment. Now, under subpart 4, regions are required to address VOCs as a precursor unless EPA determines that VOC sources do not contribute significantly to PM concentrations. The starting presumption has thus changed, but scientific evaluation can still override that presumption. In the Valley, there is extensive scientific research and technical analysis demonstrating that VOC reductions do not contribute to PM_{2.5} attainment. As such, the Valley's VOC emissions do not need to be reduced to address EPA's PM_{2.5} standard.

The role of VOCs in the Valley's PM_{2.5} concentrations is discussed in detail in Chapter 4 and Appendix F (Modeling Protocol) of the *2012 PM_{2.5} Plan*, and is summarized here.

As noted in Appendix F¹³, to evaluate the significance and effectiveness of VOC controls, isopleths of PM_{2.5} nitrate response generated with the CIT-UCD model of the January 4-6, 2006 IMS-95 episode accounted for both NO_x and VOC emission reductions¹⁴. This modeling showed that NO_x controls are the most effective approach to reduce PM_{2.5} nitrate concentrations, and once NO_x controls are taken into consideration, VOC emission reductions produce essentially no benefit. In fact, in some instances, VOC emissions reductions may actually lead to an increase in PM_{2.5} nitrate formation. Nitrogen-containing molecules such as PAN can act as temporary sinks for NO₂. When VOCs are controlled, the reduced availability of certain radicals which are

¹³ *2012 PM_{2.5} Plan* Appendix F (Modeling Protocol), p 32. <http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/16%20Appendix%20F%20Modeling%20Protocol.pdf>

¹⁴ Kleeman, M.J., Ying, Q., and Kaduwela, A., 2005, Control strategies for the reduction of airborne particulate nitrate in California's San Joaquin Valley, *Atmospheric Environment*, 39, 5325-5341.

generated from VOCs reduces the amount of NO₂ that is sequestered, thereby increasing the availability of NO₂ and enhancing ammonium nitrate formation¹⁵.

For the 2012 PM_{2.5} Plan, the effectiveness of reducing PM_{2.5} precursors, including VOCs, was compared to reducing direct PM_{2.5} emissions was quantified using inter-pollutant equivalency ratios¹⁶. Sensitivity analysis was performed for 10% reductions of primary PM_{2.5} as well as for each precursor separately. The change in PM_{2.5} concentrations per unit emissions change was then determined by dividing the change in the 24-hour PM_{2.5} design value by the amount of emission reductions corresponding to the 10% reduction. The equivalency ratios between PM_{2.5} precursors and primary PM_{2.5} were determined by dividing primary PM_{2.5} effectiveness by the precursors' effectiveness.

The results of the modeling runs are plotted on isopleth diagrams, also referred to as carrying capacity diagrams. These carrying capacity diagrams show the level of emissions that the atmosphere can "carry" and still demonstrate attainment. These diagrams help show what combinations of precursor emissions reductions (including which precursors are most effective to reduce as well as the magnitude of reductions needed) might lead to attainment, informing the development of a corresponding control strategy. The carrying capacity diagrams presented in Chapter 4 of the 2012 PM_{2.5} Plan (Figures 4-15 through 4-24)¹⁷ show that NO_x and directly-emitted PM_{2.5} are the most effective precursors to reduce to improve 24-hour PM_{2.5} design values, while additional VOC reductions do not correspond to improvements in PM_{2.5} design values.

3.4.2 VOC Controls

As noted in section 3.4.1, under subpart 4, regions are required to address VOC as a precursor unless EPA determines that VOC sources do not contribute significantly to PM concentrations. Extensive scientific research and technical analysis described above (and more extensively in the 2012 PM_{2.5} Plan) demonstrates that VOC reductions do not contribute to the Valley's PM_{2.5} attainment.

That said, the Valley's VOC emissions have been significantly reduced through stringent District regulations as part of the District's ozone attainment planning efforts. Each District VOC regulation was evaluated in depth for the 2009 RACT SIP¹⁸ as well as for the 2007 Ozone Plan¹⁹. Each VOC rule has also been approved by EPA as

¹⁵ Meng, Z., Dabdub, D., and Seinfeld, J.H., 1997, Chemical Coupling Between Atmospheric Ozone and Particulate Matter, Science, 277, 116-119.

¹⁶ 2012 PM_{2.5} Plan Appendix F (Modeling Protocol), p 127. <http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/16%20Appendix%20F%20Modeling%20Protocol.pdf>

¹⁷ 2012 PM_{2.5} Plan Chapter 4, p 4-31 through 4-40. <http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/04%20Chapter%204%20Sci%20Foundation%20and%20Modeling.pdf>

¹⁸ SJVAPCD (April 16, 2009). Chapter 4: Rule Analysis from the 2009 RACT SIP. Retrieved from:

http://www.valleyair.org/Air_Quality_Plans/docs/RACTSIP-2009.pdf

¹⁹ SJVAPCD (April 2007). 2007 Ozone Plan Appendix I (Candidate Control Measures). Retrieved from:

http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/26%20Appendix%20I%20April%202007.pdf

meeting reasonably available control technology (RACT) levels of emission control within the last two years. Table 3 in the District's *2014 RACT State Implementation Plan (SIP)*²⁰ lists each of the District's VOC rules and their respective EPA RACT approval date.

Because the science indicates that VOC reductions do not reduce PM_{2.5} levels, and because the nation's most stringent VOC controls are already in place in the Valley, the Valley's VOC emissions do not need to be further reduced to address EPA's PM_{2.5} standard.

4 REASONABLE FURTHER PROGRESS (RFP)

In CAA Subpart 4, Section 189(c)(1) requires that PM plan submissions to EPA contain quantitative milestones which are to be achieved every three years until the area is redesignated attainment and which demonstrate RFP toward attainment by the applicable date. This requirement is more general than the one specified in EPA's 2007 implementation rule²¹, followed in Section 9.3 of the *2012 PM_{2.5} Plan*. The linear progress milestones identified in the 2012 plan can serve as the quantitative milestones for subpart 4.

Table 9-4 in the *2012 PM_{2.5} Plan* identifies target emissions levels for generally linear progress that can serve as the quantitative milestones for subpart 4. Table 9-5 in the *2012 PM_{2.5} Plan* demonstrates that the plan's adopted control strategy meets these quantitative milestones. These milestones are summarized in Table 2 below.

Table 2 Quantitative Milestones

	2014	2017
Directly emitted PM _{2.5}	73.5	67.6
NO _x	315.5	251.4
SO _x	10.6	9.6

5 CONTINGENCY MEASURES

5.1 Subpart 4 Contingency Requirements

Contingency measures are extra emissions reductions that go into effect automatically without further regulatory action. In an attainment plan, the measures must be "extra" in the sense that the reductions are not accounted for in RFP or in the attainment demonstration. The total emissions reductions available from contingency measures

²⁰ SJVAPCD (June 2014) 2014 RACT SIP. Retrieved from: http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2014/June/final/09.pdf

²¹ 72 FR 20633, codified at 40 CFR 51 Subpart Z Section 51.1000 (Definitions)

should be equivalent to about one year of reductions needed for RFP²² as discussed in Chapter 9 of the *2012 PM2.5 Plan*.

Table 3 Contingency Emissions Reductions Target (tpd)

	Contingency Need = "One year's worth of RFP"
PM2.5	2.0
NOx	21.4
SOx	0.3

Interpollutant trading can be used to demonstrate equivalent emissions reductions levels between PM2.5, NOx, and SOx reductions strategies. Appendix G of the *2012 PM2.5 Plan* documents the methodology used to develop the relative efficacy of emission reductions from the different PM2.5 precursors based on photochemical modeling sensitivity runs. The current modeling using Valley-wide emissions reductions demonstrates that the greatest benefits are achieved from reductions in directly emitted PM2.5, followed by NOx (based on EPA's relative response factor procedures). Kern County specific model sensitivity runs were also conducted to evaluate the benefits of emission reductions focused on the Bakersfield area. These runs show that directly emitted PM2.5 emission reductions are approximately eight times more effective than NOx reductions. Additionally, due to the photochemistry of ammonium sulfate formation, one ton of SOx reductions is equivalent to one ton of PM2.5 reductions; therefore, for contingency purposes, SOx is equivalent to directly emitted PM2.5.

Subpart 4 does not have specific requirements for contingency, so the previously-identified RFP milestone years of 2014 and 2017 still apply. Attainment year (2019) contingencies no longer apply at this time, since the *2012 PM2.5 Plan* is now a request for reclassification to serious with the associated attainment year extension to 2019. Therefore, the contingency measures demonstration for 2014 and 2017 presented in Section 9.4 of the *2012 PM2.5 Plan* therefore satisfy subpart 4 requirements, and are summarized below.

5.2 *PM2.5 Plan* Contingency Demonstration

Contingency measures can include measures already adopted and scheduled for implementation, as long as these measures are not relied on to provide emissions reductions needed to provide for RFP or expeditious attainment. For 2014 and 2017, the District is utilizing two types of contingency measures:

1. Surplus reductions from implementation of traditional regulations
2. SIP-creditable incentive-based emissions reductions

²² Clean Air Fine Particle Implementation Rule [PM2.5 Implementation Rule]. 72 Fed. Reg. 79, pp. 20586–20667. At 20642-43. (2007, April 25). Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2007-04-25/pdf/E7-6347.pdf#page=1>

5.2.1 Surplus Reductions from Implementation of Traditional Regulations

Although contingency measures must be surplus to RFP and attainment calculations, areas are not required to wait until there is an RFP or attainment failure to implement the measures. As shown in the RFP demonstration in chapter 9 of the *2012 PM_{2.5} Plan*, significant regulatory emissions reductions are being achieved by 2014 and 2017 – more than the minimum needed to demonstrate RFP. As such, the difference between the RFP target emissions level and the actual projected emissions level can serve as contingency reductions in 2014 and 2017. The following table shows the amount of reductions available in 2014 and 2017, as documented in Chapter 9 of the *2012 PM_{2.5} Plan*.

Table 4 Reductions Surplus to RFP for Contingency (tpd)
(Table 9-7 in the *2012 PM_{2.5} Plan*)

Year	2014			2017		
	RFP target emissions level	Projected emissions inventory	Contingency	RFP target emissions level	Projected emissions inventory	Contingency
PM _{2.5}	73.5	64.4	9.1	67.6	63.2	4.4
NO _x	315.5	275.7	39.8	251.4	226.9	24.5
SO _x	10.6	8.6	2.0	9.6	8.8	0.8

The control measures achieving the contingency reductions include amendments to Rule 4692 (Commercial Charbroiling), ARB mobile source measures and adopted stationary and area source measures such as District Rule 4307 (Boilers, Steam Generators, and Process Heaters – 2.0 MMBtu/hr to 5.0 MMBtu/hr), Rule 4308 (Boilers, Steam Generators, and Process Heaters- 0.075 MMBtu/hr to less than 2.0 MMBtu/hr), Rule 4320 (Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr), Rule 4702 (Internal Combustion Engines), and Rule 4103 (Open Burning). All of the aforementioned control measures are discussed in detail in Chapter 9 of the *2012 PM_{2.5} Plan*.

5.2.2 Sufficient Contingency Reductions

The following table shows how the abovementioned combination of approaches reduces enough emissions to meet contingency requirements for 2014 and 2017.

**Table 5 Demonstration of Sufficient Contingency Reductions, 2014 and 2017
(based on Table 9-9 of the 2012 PM2.5 Plan)**

	2014	2017	PM2.5 Plan Data reference ²³
PM2.5			
<i>Surplus from traditional regulations</i>	9.1	4.4	Tables 9-7 and 9-8
<i>Regulations with contingency trigger</i>	0	0	Section 9.4.1.2
<i>Subtract PM2.5 reductions, trade for SOx</i>	0	0	1:1 trading ratio*
<i>Subtract PM2.5 reductions, trade for NOx</i>			1:8 trading ratio*
Total contingency reductions achieved	9.1	4.4	
Contingency reductions required	2.0		Table 9-6
Contingency need met?	Yes	Yes	
NOx			
<i>Surplus from traditional regulations</i>	39.7	24.4	Tables 9-7 and 9-8
<i>Regulations with contingency trigger</i>	0	0	Section 9.4.1.2
<i>SIP-creditable incentives</i>	0	0	Section 9.4.1.3
<i>Substitute PM2.5 reductions</i>			Above, with 1:8 trading ratio*
Total contingency reductions achieved	39.7	24.4	
Contingency reductions required	21.4		Table 9-6
Contingency need met?	Yes	Yes	
Sox			
<i>Surplus from traditional regulations</i>	2.0	0.8	Tables 9-7 and 9-8
<i>Regulations with contingency trigger</i>	0	0	Section 9.4.1.2
<i>SIP-creditable incentives</i>	0	0	Section 9.4.1.3
<i>Substitute PM2.5 reductions</i>			Above, with 1:1 trading ratio*
Total contingency reductions achieved	2.0	0.8	
Contingency reductions required	0.3		Table 9-6
Contingency need met?	Yes	Yes	

* 1 ton of direct PM2.5 emissions reductions is equivalent to 1 ton of SOx reductions or 8 tons of NOx reductions as demonstrated in the Weight of Evidence (Appendix G). These ratios are conservative estimates summarizing the plan as a whole, not reflecting ratios appropriate for New Source Review (NSR)

6 NEW SOURCE REVIEW PROGRAM

On April 21, 2011, the District's NSR rule (Rule 2201) was amended to address the federal PM2.5 nonattainment NSR permitting requirements of subpart 1. These amendments were based on EPA's two final rules called "Clean Air Fine Particle Implementation" (promulgated on April 25, 2007, 72 FR20586) and "Implementation of the New Source Review (NSR) Program for Particulate Matter Less than 2.5 Microns" (PM2.5 NSR Rule) requirements (promulgated on May 16, 2008, 73 FR28321) which outlined the necessary requirements of subpart 1 of Part D of Title I of the CAA. Items

²³ SJVUAPCD. 2012 PM2.5 Plan. Retrieved on 4/11/14 from http://www.valleyair.org/Air_Quality_Plans/PM25Plan2012/CompletedPlanbookmarked.pdf.

addressed in the April 2011 amendments to Rule 2201 included defining major sources of PM_{2.5} at 100 tons per year, establishing PM_{2.5} significant emissions rates to determine when NSR requirements apply to modified sources, establishing the PM_{2.5} offset ratio, and allowing for PM_{2.5} interpollutant emission offset ratios. The District's April 2011 NSR amendments fulfilled the necessary NSR SIP requirements previously established by EPA as necessary under subpart 1.

EPA then issued its June 2, 2014 PM_{2.5} final rule in response to a remand from the D.C. Circuit Court of Appeals in January 2013 which, in part, required that subpart 4 be applied to PM_{2.5} permitting programs, rather than subpart 1. Under this final rule, the District must demonstrate that its permitting program satisfies the nonattainment new source review SIP elements pursuant to subpart 4 of the federal CAA. EPA set a deadline of December 31, 2014 for such submittals.

EPA's rulemaking clarifying NSR requirements for PM_{2.5} under subpart 4 is forthcoming, but, unfortunately, will not be proposed until late summer or fall of 2014. It is not expected to be finalized until several months thereafter. Waiting for EPA to finalize its NSR rulemaking would not allow the District sufficient time to meet the December 31, 2014 deadline. Rather than await EPA's rulemaking and, as a result, missing federal rule development deadlines, this document describes how the District already satisfies subpart 4 requirements for NSR.

As described in this document, no additional NSR SIP elements or NSR rule modifications are necessary to augment the District's previous NSR SIP submittal pursuant to subpart 1. This document demonstrates that the existing NSR rule, as adopted by the District on April 21, 2011, meets all subpart 4 requirements.

6.1 Permitting PM_{2.5} Precursors at Major Sources

Section 189(e) of subpart 4 of the CAA requires the control of PM₁₀ precursors at major stationary sources "except where the Administrator determines that such sources do not contribute significantly to PM₁₀ levels which exceed the standard in the area."

PM_{2.5} precursors are emissions of NO_x, SO_x, VOC and ammonia that contribute to PM_{2.5} formation. Under Rule 2201, section 3.31, NO_x and SO_x are currently identified and controlled as precursors to PM_{2.5}, and thus Rule 2201 meets the requirements of subpart 4 with respect to NO_x and SO_x as precursors. In the Valley, however, VOC and ammonia are not considered precursors that contribute significantly to the formation of PM_{2.5} pertaining to NSR permitting requirements.

The CAA recognized that there may be circumstances in which it is not appropriate to subject certain precursors, such as ammonia and VOC, to permitting control requirements. Based on the scientific data and modeling analyses outlined in the District's *2012 PM_{2.5} Plan*, summarized in Section 3 of this document, VOC and ammonia do not significantly contribute to PM_{2.5} formation in the Valley.

6.1.1 Ammonia

As stated previously, the District is required to address ammonia as a precursor unless it is determined that ammonia sources do not contribute significantly to PM concentrations. The District's *2012 PM_{2.5} Plan*, as summarized in section 3.3 of this document, demonstrates that control of ammonia emissions does not contribute significantly to PM_{2.5} attainment. Therefore, ammonia need not be addressed as a precursor to PM_{2.5} in the District's NSR program.

6.1.2 VOC

Similarly, the District demonstrates in the *2012 PM_{2.5} Plan* and summarizes in section 3.4 of this document that VOC does not contribute significantly to the formation of PM_{2.5} and therefore does not need to be addressed as a PM_{2.5} precursor in the District's NSR program.

Although VOC is not a significant contributor to PM_{2.5} in the Valley, Rule 2201 provides for the regulation of VOC as a precursor to ozone. The level to which major sources of VOC are controlled in the District's NSR rule is extensive, since the Valley is classified as an extreme nonattainment area for ozone. VOC sources in the Valley are major sources at 10 tpy, have an emission offset threshold of 10 tpy, have a distance offset ratio of 1.5 to 1 for new major sources of federal major modification, require BACT if daily emissions exceed 2 pounds per day, and have a significant modification level set to zero for federal major modifications. Therefore, VOC as an ozone precursor is controlled through the District's NSR rule at levels much lower than if they would be controlled as a PM_{2.5} precursor.

6.2 Major Source and Major Modification Thresholds

On June 2, 2014, EPA classified the Valley as a "moderate" nonattainment area for PM_{2.5} under subpart 4. Under this classification, major sources of PM_{2.5} are defined as sources with a potential to emit equal to or greater than 100 tons per year (tpy). Rule 2201, as amended April 2011, includes this threshold.

In addition, Rule 2201 specifically identifies SO_x and NO_x as precursors of PM_{2.5}, and includes appropriate thresholds for determining whether proposed emission increases of PM_{2.5}, SO_x or NO_x constitute a major modification of a major PM_{2.5} source under subpart 4. Rule 2201 also includes all the appropriate federal requirements for proposed major sources and major modifications (notification, BACT, offsets, etc.), none of which are specific to subpart 4 and are therefore already included in the latest SIP-approved version of Rule 2201.

7 CONCLUSION

As shown in this supplemental document, the *2012 PM_{2.5} Plan* satisfies all subpart 4 requirements and demonstrates that attainment by 2015 is not practicable. The District

formally requests EPA approve said plan and reclassify the Valley as a serious area. Serious area requirements will be addressed after the Valley is redesignated by EPA as a serious area and will be in conjunction with the District's 2016 air quality attainment plan.

In addition, this document demonstrates that the District's April 21, 2011 version of Rule 2201 (New and Modified Stationary Source Review Rule) fully complies with and satisfies subpart 4 requirements. The District formally requests that EPA approve this rule as satisfying NSR requirements for PM_{2.5} under subpart 4 for moderate nonattainment areas for both the 1997 and 2006 standards.

DRAFT

Attachment A: Ammonia Controls

Under subpart 4, regions are required to address ammonia as a precursor in RACT analyses and other areas of the plan unless EPA determines that ammonia sources do not contribute significantly to PM concentrations. To improve public health while also ensuring effective use of resources, additional ammonia controls should only be required when there is clear scientific evidence that reasonable measures to reduce ammonia emissions would be effective in significantly reducing ambient PM_{2.5} concentrations.

Extensive scientific research and technical analysis described above (and more extensively in the *2012 PM_{2.5} Plan*) demonstrates that ammonia reductions do not contribute to the Valley's PM_{2.5} attainment. That said, this section shows that the Valley's ammonia emissions have been significantly reduced through stringent District regulations. This section also shows that additional ammonia reductions are infeasible. Because the science indicates that ammonia reductions do not contribute to the Valley's PM_{2.5} attainment, and because additional ammonia controls are infeasible, the Valley's ammonia emissions do not need to be further reduced to address EPA's PM_{2.5} standard.

As demonstrated in Appendix B of the *2012 PM_{2.5} Plan*, the three main sources of ammonia emissions in the Valley from stationary and area sources account for 96% of the Valley's ammonia emissions are as follows (based on 2015 estimates):

- Farming Operations with 239.2 tons per day (tpd),
- Solvent evaporation from Agricultural Fertilizers at 66.1 tpd, and
- Composting Solid Waste Operations at 20.5 tpd.

The following discussion evaluates:

- Confined Animal Facilities (District Rule 4570)
- Agricultural Fertilizers
- Organic Material Composting (District Rule 4566)
- Biosolids, Animal Manure, and Poultry Litter Operations (District Rule 4565)
- Major Sources of Ammonia

A.1 Confined Animal Facilities (District Rule 4570)

I. District Rule Description:

District Rule 4570, was originally adopted on June 15, 2006 and was most recently amended on October 21, 2010. The purpose of this rule is to limit emissions of volatile organic compounds (VOC) from Confined Animal Facilities (CAF). District Rule 4570 applies to facilities where animals are corralled, penned, or otherwise caused to remain in restricted areas and primarily fed by a means other than grazing for at least 45 days in any twelve-month period. In addition to limiting VOC emissions, District Rule 4570 also includes measures that limit ammonia (NH₃) emissions from these operations; the

required measures have also reduced ammonia emissions by over 100 tpd²⁴ (this reduction is already reflected in the emissions inventory data above). The analysis below focuses on how District Rule 4570 limits NH₃ emissions in comparison to other rules and regulations.

A. Types of Confined Animal Facilities

Confined Animal Facilities are used for the raising of animals including, but not limited to, cattle, calves, chickens, ducks, goats, horses, sheep, swine, rabbits, and turkeys, which are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and fed by a means other than grazing. (CH&SC 39011.5 (a)(1)). The major categories of Confined Animal Facilities are listed below.

- Dairy Operations - Dairy operations are those operations producing milk or animals for facilities that produce milk.
- Poultry Operations - Poultry facilities operate either as layer ranches for egg production or as broiler ranches where birds are grown for the fresh meat market.
- Beef Cattle Feeding Operations – Beef cattle facilities are facilities that raise beef cattle (heifers and steers) for their meat.
- Swine Operations – These operations raise pigs for their meat. The production cycle for hogs has three (3) phases: farrowing (giving birth), nursing, and finishing.

B. Rule 4570 Applicability Thresholds

The thresholds for a facility to be classified as a large CAF in the San Joaquin Valley and the thresholds for a facility to be subject to District Rule 4570 are shown in the following table. The large CAF thresholds are based on the definition of a large CAF adopted by the California Air Resources Board (ARB) as required by California Senate Bill (SB) 700. District Rule 4570 applies to confined animal facilities that have the capacity to house a number of animals equal to or exceeding the Rule 4570 regulatory thresholds, which are lower than the large CAF thresholds for certain facilities.

²⁴ Appendix F of the Staff Report for the June 2009 re-adoption of Rule 4570, starting on the 329th page of the pdf available here http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2009/June/Agenda%20Item_10_June_18_2009.pdf

Rule 4570 Thresholds for Regulation		
Livestock Category	SJVAPCD Large CAF Thresholds	Rule 4570 Regulatory Thresholds
Dairy	1,000 milking cows	500 milking cows
Beef Feedlots	3,500 beef cattle	3,500 beef cattle
Other Cattle Facility	7,500 calves, heifers, or other cattle	7,500 calves, heifers, or other cattle
Poultry Facilities		
Chicken	650,000 head	400,000 head
Duck	650,000 head	400,000 head
Turkey	100,000 head	100,000 head
Swine Facility	3,000 head	3,000 head
Horses Facility	3,000 head	3,000 head
Sheep and Goat Facilities	15,000 head of sheep, goats, or any combination of the two	15,000 head of sheep, goats, or any combination of the two
Any livestock facility not listed above	30,000 head	30,000 head

C. Emission Control Requirements of District Rule 4570

District Rule 4570 requires multiple mitigation measures from the following CAF categories: Dairy, Beef Feedlots, Other Cattle Facilities, Swine Facilities, Poultry facilities, and various other smaller operations. Each of these facilities consists of multiple sources of emissions within the facility. Since these facilities generally cover a large area and have different processes, a single mitigation measure or technology is generally not sufficient to control overall emissions from the facility. Mitigation measures required by Rule 4570 have been tailored for each source of emissions, thereby ensuring that the overall emissions from a facility are reduced. The current methodology in Rule 4570 allows for the greatest overall control from the entire facility.

District Rule 4570 recognized the following five emission sources for all of the CAFs: Feed, Housing, Solid Waste, Liquid Waste, and Land Application of Manure. Rule 4570 requires each CAF to implement a certain number of mitigation measures for each of these sources. District Rule 4570 also distinguishes between the different types of housing configurations (freestall vs open corrals) for cattle and, as such, requires specific mitigation measures for each type of housing. By requiring mitigation measure(s) for each source of emissions at a facility, District Rule 4570 ensures that reductions are achieved throughout the facility.

The following describes some of the mitigation measures and the ways in which these measures reduce ammonia emissions:

- **Nutritional management:** Ammonia emissions result from the decomposition of undigested nitrogen compounds in animal waste. Proper nutritional management, with diets formulated to feed proper amounts of protein, improves nitrogen utilization by the animal, reducing production of ammonia from animal waste.

- Increased cleaning and removal of manure and litter from animal housing areas: Because animal waste is the primary source of ammonia emissions, increased removal of waste from animal housing areas will reduce emissions by reducing the exposed area. Proper management of the waste will stabilize the nitrogen compounds in the waste, which will reduce the rate that these compounds are converted to ammonia that can be lost to the atmosphere. In addition, ammonia is highly soluble in water; therefore, when a flush system is used, ammonia emissions will be reduced because much of the ammonia will dissolve in the water rather than volatilize to the air.
- Incorporation of manure into fields: Incorporation of manure in fields reduces volatilization of gaseous pollutants by minimizing the amount of time that the manure is exposed to the atmosphere. Once the waste has been incorporated into the soil, VOCs and ammonia are absorbed onto soil particles, providing the opportunity for these soil microbes to oxidize these compounds into carbon dioxide, water, and nitrates.

One area to which some of these rules may apply is silage and silage-based total mixed ration (TMR) used as feed for cattle. Research has demonstrated that silage and TMR are one of the largest sources of VOC emissions at cattle facilities but are not significant sources of NH₃ emissions, which primarily results from the animal waste at Confined Animal Facilities; therefore, the measures that specifically apply to management of silage and TMR will not be discussed in detail in this analysis.

II. How does District Rule 4570 compare with federal rules and regulations?

A. EPA-Control Technique Guidelines (CTG)

There is no EPA CTG guidance document for confined animal facilities.

B. EPA - Alternative Control Technology (ACT)

There is no EPA ACT guidance document for confined animal facilities.

C. Standards of Performance for New Stationary Sources (NSPS)

There is no NSPS guidance document for guidance document for confined animal facilities.

D. National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

There is no NESHAP guidance document for confined animal facilities.

III. How does District Rule 4570 compare to rules in other air districts?

As the largest agricultural area in California, the District took the lead in devising a list of mitigation measures for the various emission sources during the initial development of District Rule 4570. This list of mitigation measures was essentially utilized, almost identically, by all air districts in their rules. However, during the last amendments to District Rule 4570, all of the mitigation measures were reevaluated in light of the latest available science. In comparison to the previous version of the rule, the current rule lowered threshold limits to bring in additional CAFs, requires additional mitigation measures, clarified previous mitigation measures, and added additional monitoring, testing, and recordkeeping to improve enforceability.

The following California air district rules were compared to District Rule 4570:

- South Coast AQMD Rule 223, adopted June 2, 2006
- South Coast AQMD Rule 1127, adopted August 6, 2004
- Bay Area AQMD Regulation 2 Rule 10, adopted July 19, 2006
- Ventura County APCD Rule 23 (Exemptions), amended April 8, 2008
- Sacramento Metropolitan AQMD Rule 496, adopted August, 24, 2006
- Imperial County APCD Rule 217 and Policy 38, adopted October 10, 2006
- Butte County AQMD Rule 450, adopted December 21, 2006

Idaho Administrative Procedure Act (IDAPA) 58.01.01 Sections 760-764 was also compared with District Rule 4570 and the analysis is shown below.

It is important to note that only District Rule 4570, Sacramento Metropolitan AQMD Rule 496, and South Coast AQMD Rule 1127 are prohibitory rules. For this reason, these rules include detailed recordkeeping as well as monitoring and testing requirements. Generally, the level of detail in a prohibitory rule is absent from permits rules because the purpose of a permit rule is different from the purpose of a prohibitory rule.

A. South Coast AQMD (SCAQMD) Rule 223

Applicability/Exemption/Large CAF Definition

SCAQMD Rule 223 was adopted on June 2, 2006 and has not been amended.

SCAQMD Rule 223 applies to large CAFs as defined by ARB. District Rule 4570 defines large CAFs the same way except for large CAFs for horses. District Rule 4570 defines a large CAF for horses as having at least 3,000 head, whereas SCAQMD Rule 223 defines a large CAF for horses as having at least 2,500 head. There are currently no CAFs in the San Joaquin Valley with the capacity to house at least 2,500 horses and no CAFs for horses in the San Joaquin Valley are expected to exceed this threshold in the foreseeable future.

In addition to applying to large CAFs, District Rule 4570 lowers the applicability thresholds for the following CAFs:

- Dairies – from 1,000 milk cows to 500 milk cows

- Broilers/Ducks and Layers – from 650,000 birds to 400,000 birds

Therefore, Rule 4570 is more stringent regarding applicability.

Requirements for Dairy CAFs

Feed Mitigation Measures

District Rule 4570 has seven mitigation measures for feed and two mitigation measures for silage. Operators must implement four mandatory feed mitigation measures and choose another one from a list of three, for a total of five mitigation measures required for feed. In the SCAQMD rule, there are nine feed mitigation measures, from which the operator must implement five. Both rules require selection of five mitigation measures for feed, excluding silage, but four of the five feed mitigation measures are mandatory in District Rule 4570. Therefore, overall District Rule 4570 is more stringent.

Milk Parlor Mitigation Measures

The milk parlor mitigation measures for SCAQMD includes one Class One and one Class Two mitigation measure. District Rule 4570 contains the same mitigation measures included in the SCAQMD rule as Class One and has removed the Class Two mitigation measures due to infeasibility; see the Staff Report for the October 21, 2010 amendments to Rule 4570 for more detail. Therefore, both rules will be considered identical in this category.

Freestall Mitigation Measures

District Rule 4570 has five mitigation measures, two of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. SCAQMD Rule 223 has eight Class One mitigation measures, from which facilities are required to implement at least two. District Rule 4570 requires one additional mitigation measure; therefore, District Rule 4570 is more stringent.

SCAQMD Rule 223 has three Class One mitigation measures that require increased frequency in comparison to the corresponding District Rule 4570 measures: (*inspect water pipes and troughs and repair leaks; remove animal waste that is not dry from individual cow freestall beds; and rake, harrow, scrape, or grade bedding in freestalls*). The South Coast rule requires pipes and troughs to be inspected daily, and manure from freestall beds to be removed daily, whereas District Rule 4570 does not require inspection of pipes and troughs in freestall barns. In the San Joaquin Valley the majority of freestall barns use flush systems for manure management and may also use misters or water sprays to keep animals cool; therefore, inspection of the pipes and troughs in the freestall barns was determined to be irrelevant since this is already a wet system.

SCAQMD Rule 223 requires freestall beds to be raked/harrowed/graded at least twice every seven days, whereas District Rule 4570 requires this measure to be carried out once every 7 days for large dairies and once every 14 days for medium dairies. Although, SCAQMD Rule 223 has a higher frequency for these measures, the emissions generated from these sources are not significant, including the reductions achieved from the overall dairy. In addition, the CAF stakeholders have questioned the cost effectiveness of a daily frequency. Based on the above, the increased frequency required by SCAQMD Rule 223 can be considered to exceed RACT requirements.

Corral Mitigation Measures

District Rule 4570 has nine mitigation measures, six of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. SCAQMD Rule 223 has 14 Class One mitigation measures and two Class Two mitigation measures, from which facilities are required to choose at least six. District Rule 4570 requires one additional mitigation measure; therefore, District Rule 4570 is more stringent.

SCAQMD Rule 223 has one Class One mitigation measure (*inspect water pipes and troughs and repair leaks*) that require increased frequency in comparison to the corresponding District Rule 4570 measure. SCAQMD Rule 223 requires this measure to be carried out daily, whereas District Rule 4570 requires it to be carried out only once every seven days. Although, SCAQMD Rule 223 has a higher frequency for this measure, the difference in the emissions reductions from the two frequencies is not expected to be significant. In addition, as discussed earlier the frequency required by SCAQMD Rule 223 exceeds RACT when compared to inspection leak requirements in other rules and regulations.

Solid Waste and Separated Solids Mitigation Measures

District Rule 4570 contains only two mitigation measures, from which operators are required to choose at least one. SCAQMD Rule 223 has three Class One mitigation measures and three Class Two mitigation measures, from which facilities are required to choose at least two.

Available studies have indicated that NH₃ emissions from stored solid waste and separated solids pile to be a very small fraction of total NH₃ emissions at dairies. Since the NH₃ emissions from solid manure account for a very small fraction of emissions from the overall dairy, there would not be a significant increase in NH₃ emission reductions if more measures are required from this category.

Liquid Waste Mitigation Measures

District Rule 4570 has four mitigation measures, from which operators are required to choose at least one. SCAQMD Rule 223 has five Class One

mitigation measures and five Class Two mitigation measures, from which operators are required to choose at least one. Since only one measure is required by both rules, the rules are similar in stringency.

Manure Land Application Mitigation Measures

District Rule 4570 has two mitigation measures required out of six optional measures. SCAQMD Rule 223 has four mitigation measures, from which facilities are required to choose at least two. All the mitigation measures are similar in stringency.

Requirements for Poultry CAFs

There is a large degree of variability in the manure management practices, housing techniques, and potential feeding practices for the different type of poultry operations in the San Joaquin Valley. Due to these differences, District Rule 4570 separates poultry CAFs into the following categories: 1) layers and 2) broilers, ducks, and turkeys.

Although on the surface the poultry requirements results in fewer mitigation measures compared to the other rules, the segregating of the types of poultry has allowed the mitigation measures to be tailored specifically to the type of poultry operation. In addition, all measures for poultry in District Rule 4570 are now mandated rather than left as options. Due to this reconfiguration and taking into consideration the latest science, the District Rule 4570 requirements for poultry are more stringent than SCAQMD Rule 223.

Requirements for Other CAF Categories

In addition to dairy and poultry CAF mitigation measures discussed above, District Rule 4570 provides specific mitigation measures for beef cattle feedlots, other cattle, and swine CAFs. SCAQMD Rule 223 does not address mitigation measures for these additional CAF categories. For these types of large CAFs, District Rule 4570 is more stringent.

Requirements – Suspension and Substitution of Mitigation Measures

Both rules allow the temporary suspension of a mitigation measure upon the determination by a certified veterinarian or nutritionist that such a suspension is necessary for animal health purposes. The District must be notified within 48 hours, and a new measure must be implemented if the suspension is expected to last longer than 30 days. In addition, both rules allow for substitution of one mitigation measure with an equivalent or more stringent one with the submission of the appropriate information. Therefore, the suspension and substitution requirements of both rules are equally stringent.

Conclusion – Comparison with South Coast AQMD Rule 223

Based on the analysis of the CAF categories in District Rule 4570 and SCAQMD Rule 223, it is clear that District Rule 4570 is more stringent than SCAQMD Rule 223. There are differences in the frequency with which some mitigation measures are to be implemented. However, as stated earlier, many of these sources are a small portion of a dairy's overall emissions. The amended version of District Rule requires facilities to choose more mitigation measures and makes several mitigation measures mandatory.

District Rule 4570 also provides mitigation for more CAF categories (beef feedlots, other cattle, and swine) that are not addressed by SCAQMD Rule 223, and also has much more detailed recordkeeping requirements to demonstrate implementation of selected mitigation measures. In addition, SCAQMD recently identified District Rule 4570 as the most stringent rule for this source category in their ozone Reasonably Available Control Technology (RACT) Demonstration.^[25]

B. South Coast AQMD (SCAQMD) Rule 1127

Applicability/Exemption/Large CAF Definition

SCAQMD Rule 1127 was adopted on August 4, 2004 and has not been amended.

SCAQMD Rule 1127 applies to dairies with 50 or more cows, heifers, and/or calves. The rule applies to dairy farms and related operations such as heifer and calf farms and the manure produced on them. By comparison, District Rule 4570 applies to dairy CAFs with at least 500 milking cows, but applies to more than just manure-handling operations. Although the SCAQMD Rule has a lower applicability threshold, the overall control effectiveness of Rule 1127 when compared to District Rule 4570, is far less stringent.

Requirements for Dairy CAFs

Milking Parlor and Freestall Mitigation Measures

For the milking parlor, the District rule has one mandatory mitigation measure. District Rule 4570 has five mitigation measures for freestalls, two of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three to implement. SCAQMD Rule 1127 does not address these operations. Therefore, overall District Rule 4570 is more stringent than SCAQMD Rule 1127.

²⁵ South Coast Air Quality Management District (June 6, 2014). Reasonably Available Control Technology Demonstration. <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-jun6-031.pdf?sfvrsn=2>

Corral Mitigation Measures

District Rule 4570 has nine mitigation measures, six of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. SCAQMD Rule 1127 has eight mitigation measures, from which facilities are required to choose at least six. The mitigation measures required by SCAQMD Rule 1127 specify the removal of manure from the corrals, the minimization of water in the corrals, and the cleaning schedule and cleaning strategy for the corrals. While the mitigation measures in the two rules are not phrased the same way, they cover similar requirements. District Rule 4570 requires one additional measure; therefore, Rule 4570 is more stringent.

Solid Waste, Separated Solids, and Liquid Waste, and Manure Land Application Mitigation Measures

District Rule 4570 has two mitigation measures for solid waste/separated solids, from which operators are required to choose at least one. For liquid waste, District Rule 4570 has four mitigation measures for liquid waste, from which operators are required to choose at least one. District Rule 4570 has two mitigation measures for land application of manure required out of six optional measures. SCAQMD Rule 1127 states that manure removed must be either treated at an approved manure processing operation, or applied on agricultural land with local approval. SCAQMD Rule 1127 does not specify different mitigation measures for solid waste, separated solids, or liquid waste. District Rule 4570 has specific mitigation measures for each of these operations; therefore, it is able to better target the reduction of emissions from these the different operations. District Rule 4570 is therefore as stringent as or more stringent than SCAQMD Rule 1127.

Requirements for Other CAFs

District Rule 4570 provides specific mitigation measures for beef cattle feedlots, other cattle facilities, poultry facilities, and swine facilities. SCAQMD Rule 1127 does not address mitigation measures for these additional CAF categories. Therefore, District Rule 4570 is more stringent for this category.

Requirements – Suspension and Substitution of Mitigation Measures

SCAQMD Rule 1127 provides one exemption per year from one of the corral clearings required every 90 days if the moisture content in the corrals is greater than 50%. The operator is required to notify SCAQMD 30 days before the required cleaning, and test moisture content weekly. If moisture content is still above 50% when the cleaning is due, the operator may claim the exemption.

In comparison, District Rule 4570 allows an operator to temporarily suspend any mitigation measure as long as the suspension is recommended by a licensed

veterinarian or animal nutritionist on the basis of animal health. The operator must notify the District within 48 hours prior to the suspension. If the suspension is expected to last longer than 30 days, then the operator must submit a new mitigation plan that identifies a new mitigation measure to be implemented in place of the suspended one.

District Rule 4570's exemption under this category is much more stringent because it is only a temporary suspension that cannot exceed 30 days, whereas SCAQMD Rule 1127's exemption may be permanent, without any requirement to substitute another measure.

Therefore, in this category of mitigation measure suspensions/substitutions, District Rule 4570 is more stringent than SCAQMD Rule 1127.

Testing, Monitoring, Recordkeeping Requirements

Both SCAQMD Rule 1127 and District Rule 4570 require monitoring, record keeping and source testing as appropriate and sufficient to provide evidence of each mitigation measure being implemented.

In addition to record keeping, Rule 1127 requires an annual report of manure being shipped out from the dairy. No annual reporting is required by Rule 4570. Rule 1127 requires records be retained for 3 years for minor sources and 5 years for major sources, whereas Rule 4570 requires records be retained for five years for all sources.

Overall, the monitoring, testing and record keeping requirements are similar for both rules.

Conclusion – Comparison with South Coast AQMD Rule 1127

For dairy CAFs, District Rule 4570 is more stringent than SCAQMD Rule 1127. District Rule 4570 requires emission reductions from additional emission categories - milk parlors, freestall barns, and liquid manure - that are not addressed by SCAQMD Rule 1127 as well as requiring emission reductions from CAFs from other animal species. As mentioned above, the current version of District Rule 4570 requires facilities to choose more mitigation measures and makes several mitigation measures mandatory. District Rule 4570 also provides specific mitigation measures for beef cattle feedlots, other cattle, poultry, and swine CAFs, while SCAQMD Rule 1127 does not. District Rule 4570 is, therefore, more stringent than SCAQMD Rule 1127.

C. Bay Area AQMD (BAAQMD) Regulation 2 Rule 10 (Rule 2-10)

BAAQMD Rule 2-10 is a permit rule. As such, it has fewer specifics about large CAFs than District Rule 4570, which is a prohibitory rule.

Applicability/Exemption/Large CAF Definition

BAAQMD Rule 2-10 was adopted on July 19, 2006 and has not been amended.

BAAQMD Rule 2-10 applies to large CAFs as defined by ARB. District Rule 4570 defines large CAFs the same way except for large CAFs for horses. District Rule 4570 defines a large CAF for horses as having at least 3,000 head, whereas BAAQMD Rule 2-10 defines a large CAF for horses as having at least 2,500 head. There are currently no CAFs in the San Joaquin Valley with the capacity to house at least 2,500 horses and no CAFs for horses in the San Joaquin Valley are expected to exceed this threshold in the foreseeable future.

In addition to applying to large CAFs, District Rule 4570 lowers the applicability thresholds for the following CAFs:

- Dairies – from 1,000 milk cows to 500 milk cows
- Broilers/Ducks and Layers – from 650,000 birds to 400,000 birds

Therefore, Rule 4570 is more stringent regarding applicability.

Requirements for CAFs

The BAAQMD permit conditions must implement control measures that represent Reasonably Available Control Technology (RACT) to reduce emissions of VOC, NOx and PM from the facility. BAAQMD Rule 2-10 requires RACT mitigation measures rather than the more stringent BARCT controls required by District Rule 4570 as specifically noted in the BAAQMD staff report for their rule. District staff previously contacted BAAQMD staff and verified that there is no list of RACT mitigation measures in place should a large CAF apply for a permit. In this respect, District Rule 4570 is more stringent than BAAQMD Rule 2-10, especially considering that EPA has already determined that District Rule 4570 satisfies RACT for VOC emissions.^[26]

Testing, Monitoring, Recordkeeping Requirements

District Rule 4570 requires records to be maintained and retained for at least five years, whereas BAAQMD Rule 2-10 requires records to be retained for three years. District Rule 4570 therefore has a more stringent record retention requirement.

District Rule 4570 requires facilities not subject to the mitigation measure requirements to maintain sufficient records to demonstrate their exemption status. Facilities subject to the mitigation measure requirements must maintain

²⁶ United States Environmental Protection Agency, Region IX Air Division (August 2011). EPA's Analysis of San Joaquin Valley Unified Air Pollution Control District's Rule 4570, Confined Animal Facilities. <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-jun6-031.pdf?sfvrsn=2>

sufficient records to demonstrate implementation of each mitigation measure selected. Facilities must also maintain animal population records. BAAQMD Rule 2-10 requires the maintenance of animal population records but does not require specific records needed to demonstrate implementation of each mitigation measure selected. District Rule 4570 is therefore more stringent in the type of records that must be maintained.

Conclusion – Comparison with Bay Area AQMD Regulation 2 Rule 10

District Rule 4570 requires facilities to choose specific mitigation measures, makes several mitigation measures mandatory. In addition, District Rule 4570 has lower applicability thresholds for dairies, chickens, and ducks. Based on this information and the discussion above, District Rule 4570 is far more stringent than BAAQMD Rule 2-10.

D. Ventura County APCD (VCAPCD) Rule 23 – Exemptions from Permit

In response to California Senate Bill (SB) 700, VCAPCD revised its “Exemptions from Permit” rule to remove an exemption for agricultural operations, including CAFs. VCAPCD does not have a specific rule for CAFs. In its staff report for the rule revision, VCAPCD staff noted that no facilities in their jurisdiction would meet the “large CAF” definition and there was no expectation that a large CAF would move into the area in the foreseeable future; therefore, no separate CAF rule was necessary.

Applicability/Exemption/Large CAF Definition

VCAPCD Rule 23 adopted ARB’s definition of large CAFs. District Rule 4570 defines large CAFs the same way except for large CAFs for horses. District Rule 4570 defines a large CAF for horses as having at least 3,000 head, whereas VCAPCD Rule 23 defines a large CAF for horses as having at least 2,500 head. There are currently no CAFs in the San Joaquin Valley with the capacity to house at least 2,500 horses and no CAFs for horses in the San Joaquin Valley are expected to exceed this threshold in the foreseeable future.

In addition to applying to large CAFs, District Rule 4570 lowers the applicability thresholds for the following CAFs:

- Dairies – from 1,000 milk cows to 500 milk cows
- Broilers/Ducks and Layers – from 650,000 birds to 400,000 birds

Therefore, Rule 4570 is more stringent regarding applicability.

Requirements for CAFs

There are no facilities that would trigger the large CAF threshold within Ventura County, as stated in the Ventura County CAPCD staff report for amending Rule

23. The VCAPCD New Source Review Rule does not list mitigation measures for large CAFs. Instead, BACT would be triggered by a new CAF that met the “large CAF” definition or BACT would be triggered if an existing CAF expanded operations enough to meet the “large CAF” definition. At that point, VCAPCD staff would determine BACT for the CAF.

Conclusion – Ventura County APCD Rule 23

Ventura County APCD does not have a specific rule for CAFs; therefore, District Rule 4570 is more stringent.

E. Sacramento Metropolitan AQMD (SMAQMD) Rule 496

Like District Rule 4570, Sac Metro AQMD Rule 496 is a prohibitory rule, meaning that there are detailed requirements for operators.

Applicability/Exemption/Large CAF Definition

SMAQMD Rule 496 was adopted on August 24, 2006 and has not been amended.

SMAQMD Rule 496 applies to large CAFs as defined by ARB. District Rule 4570 defines large CAFs the same way except for large CAFs for horses. District Rule 4570 defines a large CAF for horses as having at least 3,000 head, whereas SMAQMD Rule 496 defines a large CAF for horses as having at least 2,500 head. There are currently no CAFs in the San Joaquin Valley with the capacity to house at least 2,500 horses and no CAFs for horses in the San Joaquin Valley are expected to exceed this threshold in the foreseeable future.

In addition to applying to large CAFs, District Rule 4570 lowers the applicability thresholds for the following CAFs:

- Dairies - 1,000 milk cows to 500 milk cows
- Broilers/ducks and Layers – 650,000 – 400,000

Therefore, Rule 4570 is more stringent regarding applicability.

Requirements for Dairy CAFs

Feed Mitigation Measures

District Rule 4570 has seven mitigation measures for feed and two mitigation measures for silage. Operators must implement four mandatory feed mitigation measures and chose another one from a list of three, for a total of five mitigation measures required for feed.

SMAQMD Rule 496 has seven Class One mitigation measures for feed and two Class One mitigation measures for silage. Operators must implement four feed mitigation measures and one silage mitigation measure.

District Rule 4570 requires a total of five feed mitigation measures, excluding silage, which is greater than the four feed mitigation measures required by SMAQMD Rule 496. In addition, four of the five feed mitigation measures are mandatory in District Rule 4570. Therefore, District Rule 4570 is more stringent.

Milk Parlor Mitigation Measures

District Rule 4570 has one required milk parlor mitigation measure. SMAQMD Rule 496 also only requires one mitigation measure for milk parlors. Since both rules only require the use of one mitigation measure, both rules will be considered identical for this category.

Freestall Mitigation Measures

District Rule 4570 has five freestall mitigation measures, two of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. SMAQMD Rule 496 has eight Class One mitigation measures and one Class Two mitigation measure from which facilities are required to implement at least two.

Rule 4570 will be considered more stringent since it requires more mitigation measures.

Corral Mitigation Measures

District Rule 4570 has nine corral mitigation measures, six of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. SMAQMD Rule 496 has 15 Class One mitigation measures, which are all optional, and three Class Two mitigation measures, from which facilities are required to choose at least six. District Rule 4570 requires one additional mitigation measure; therefore in this respect District Rule 4570 is more stringent.

SMAQMD Rule 496 has one Class One mitigation measure (*inspect water pipes and troughs and repair leaks*) that require increased frequency in comparison to the corresponding District Rule 4570 measure. SMAQMD Rule 496 rule requires this measure to be carried out daily, whereas District Rule 4570 requires it to be carried out only once every seven days. Although, SMAQMD Rule 496 has a higher frequency for this measure, the difference in the emissions reductions from the two frequencies is not expected to be significant. In addition, as discussed earlier the frequency required by SMAQMD Rule 496 exceeds RACT

when compared to inspection leak requirements in other rules and regulations. Overall, District Rule 4570 is more stringent.

Solid Waste and Separated Solids Mitigation Measures

District Rule 4570 contains only two mitigation measures, from which operators are required to choose at least one. SMAQMD Rule 496 has five Class One mitigation measures and three Class Two mitigation measures, from which facilities are required to choose at least two.

Available studies have indicated that NH₃ emissions from stored solid waste and separated solids pile to be a very small fraction of total NH₃ emissions at dairies. Since the NH₃ emissions from solid manure account for a very small fraction of emissions from the overall dairy, there would not be a significant increase in NH₃ emission reductions if more measures are required from this category.

Liquid Waste Mitigation Measures

District Rule 4570 has four mitigation measures, from which operators are required to choose at least one. SMAQMD Rule 496 has four Class One mitigation measures and four Class Two mitigation measures, from which facilities are required to choose at least one. Since only one measure is required, both rules are equivalent in this respect.

Manure Land Application Mitigation Measures

District Rule 4570 has two mitigation measures required out of six measures. SMAQMD Rule 496 has six Class One mitigation measures, from which facilities are required to choose at least two. Since two mitigation measures are required, both rules are equivalent in this respect.

Requirements for Poultry Large CAFs

There is a large degree of variability in the manure management practices, housing techniques, and potential feeding practices for the different type of poultry operations in the San Joaquin Valley. Due to these differences, District Rule 4570 separates poultry CAFs into the following categories: 1) layers and 2) broilers, ducks, and turkeys.

Although on the surface the poultry requirements results in fewer mitigation measures compared to the other rules, the segregating of the types of poultry has allowed the mitigation measures to be tailored specifically to the type of poultry operation. In addition, all measures for poultry in District Rule 4570 are now mandated rather than left as options. Due to this reconfiguration and taking into consideration the latest science, the District Rule 4570 requirements for poultry are more stringent than SMAQMD Rule 496.

Other CAFs

In addition to dairy and poultry CAF mitigation measures discussed above, District Rule 4570 provides specific mitigation measure option tables for beef cattle feedlots, other cattle facilities, and swine facilities. SMAQMD Rule 496 does not address mitigation measures for these additional CAF categories. For these types of large CAFs, District Rule 4570 is more stringent.

Requirements – Suspension and Substitution of Mitigation Measures

Both rules allow for substitution of one mitigation measure with an equivalent or more stringent measure with the submission of the appropriate application. District Rule 4570 also allows the temporary suspension of a mitigation measure upon the determination by a certified veterinarian or nutritionist that such a suspension is necessary for animal health purposes. The District must be notified within 48 hours, and a new measure must be implemented if the suspension is expected to last longer than 30 days. SMAQMD Rule 496 does not have a specific provision for temporary suspension of mitigation measures. As discussed above, District Rule 4570 is as stringent as SMAQMD Rule 496.

Testing, Monitoring, Recordkeeping Requirements

The testing, monitoring, and recordkeeping provisions of District Rule 4570 and SMAQMD Rule 496 are nearly identical and are of equal stringency.

Conclusion – Comparison with Sac Metro AQMD Rule 496

For dairy CAFs, District Rule 4570 is more stringent than SMAQMD Rule 496. District Rule 4570 requires emission reductions from four additional emission categories - milk parlors, feed, freestall barns, and liquid manure - that are not addressed by SMAQMD Rule 496 as well as having specific requirements for other types of CAFs. District Rule 4570 also requires facilities to choose more mitigation measures and mandates several mitigation measures. In addition, Rule 4570 applies to dairies with greater than 500 milk cows and 400,000 layers and broilers while SMAQMD Rule 496 applies to dairies with 1,000 milk cows or more and broiler and layer operations with more than 650,000 birds. As shown in the discussion above, District Rule 4570 is more stringent than SMAQMD Rule 496.

F. Imperial County APCD (ICAPCD) Rule 217 – Large Confined Animal Facilities Permits Required and ICAPCD Policy Number 38 – Recommended Mitigation Measures for Large Confined Animal Facilities

Imperial County APCD Rule 217 is a permits rule. ICAPCD Rule 217 requires that owners or operators of large CAFs submit an emissions mitigation plan that demonstrates that the facility will use RACT to reduce emissions of pollutants that

contribute to the non-attainment of any ambient air quality standard and are within the ICAPCD's regulatory authority.

ICAPCD Rule 217 requires operators of large CAFs to implement the control measures identified in their emissions mitigation plan, which may be selected from the ICAPCD Policy Number 38, Recommended Mitigation Measures for Large Confined Animal Facilities. ICAPCD Policy Number 38 specifies the number of mitigation measures the operator should implement for each operation within the CAF. The following discussion compares the recommended mitigation measures in ICAPCD Policy Number 38 to the measures in District Rule 4570. However, since the mitigation measures in ICAPCD Policy Number 38 are only recommended by ICAPCD Rule 217 rather than being explicitly required, it is clear that District Rule 4570 is more stringent.

Applicability/Exemption/Large CAF Definition

Imperial County Rule 217 was adopted on October 10, 2006 and has since not been amended.

ICAPCD adopted ARB's definition of large CAF. District Rule 4570 defines large CAFs the same way except for large CAFs for horses. District Rule 4570 defines a large CAF for horses as having at least 3,000 head, whereas ICAPCD Rule 217 defines a large CAF for horses as having at least 2,500 head. There are currently no CAFs in the San Joaquin Valley with the capacity to house at least 2,500 horses and no CAFs for horses in the San Joaquin Valley are expected to exceed this threshold in the foreseeable future.

In addition to applying to large CAFs, District Rule 4570 lowers the applicability thresholds for the following CAFs:

- Dairies – from 1,000 milk cows to 500 milk cows
- Broilers/Ducks and Layers – from 650,000 birds to 400,000 birds

ICAPCD Policy Number 38 only lists mitigation measures for dairy operations and beef feedlot operations while District Rule 4570 covers additional CAFs (swine, chicken layer, chicken broiler, duck and turkey, and other CAFs). Therefore, more CAFs are subject to the requirements of District Rule 4570 than ICAPCD Rule 217.

Therefore, Rule 4570 is more stringent regarding applicability.

Requirements for Dairy CAFs

Milk Parlor Mitigation Measures

ICAPCD Policy Number 38 has only one mitigation measure for the milk parlor. The District rule also only has one mitigation measure. Since the mitigation measure is identical, both rules are identical under this section.

Freestall Mitigation Measures

District Rule 4570 has five freestall mitigation measures, two of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. ICAPCD Policy Number 38 has eight mitigation measures, from which operators are required to choose at least two. Since District Rule 4570, requires three mitigation measures and mandates two out of the three, District Rule 4570 is more stringent than ICAPCD Policy Number 38.

Corral Mitigation Measures

District Rule 4570 has nine mitigation measures, six of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. ICAPCD Policy Number 38 has eight mitigation measures, from which facilities are required to choose at least four.

For three of the mitigation measures, the compliance times differ between the District rule and ICAPCD Policy Number 38. For these measures, ICAPCD Policy Number 38 allows longer time periods between repeated performance of the measures than District Rule 4570. For these three mitigation measures, District Rule 4570 is more stringent because District Rule 4570 requires repeated performance of the otherwise identical mitigation measures in shorter time periods.

For two of the mitigation measures, the maximum depth of manure differs significantly between the District Rule 4570 and ICAPCD Policy Number 38. For these measures, ICAPCD Policy Number 38 allows manure depths that are deeper than allowed by District Rule 4570. For these two mitigation measures, District Rule 4570 rule is more stringent because the District Rule 4570 requires shallower manure depths for otherwise identical mitigation measures.

Therefore, District Rule 4570 is far more stringent than the ICAPCD Policy Number 38.

Solid Waste and Separated Solids Mitigation Measures

District Rule 4570 has two solid waste and separated solids mitigation measures, from which operators are required to choose at least one. ICAPCD Policy Number 38 has four mitigation measures from which facilities are required to choose at least one. Therefore, both rules are identical in this category.

There are a few differences in ICAPCD Policy Number 38 mitigation measures when compared to District Rule 4570. ICAPCD Policy Number 38 policy requires that manure piles are covered year round whereas District Rule 4570 requires that the piles be covered from October through May – the months the months in the San Joaquin Valley in which rainfall is most likely. However, because of the greater depth of manure allowed in corrals and increased duration (up to two years) for removal of manure from the corrals allowed by ICAPCD Policy Number 38, CAFs in the ICAPCD are able to allow manure to accumulate in the corrals until it can be hauled offsite. Few, if any, CAFs in the ICAPCD are expected to actually store manure onsite outside of corrals, so it is likely than no facilities in ICAPCD are actually choosing and implementing this measure. Separated solids piles are not specifically addressed in ICAPCD Policy Number 38. Overall District Rule 4570 is as stringent as ICAPCD Policy Number 38.

Liquid Waste Mitigation Measures

District Rule 4570 has four liquid waste mitigation measures mitigation measures, from which operators are required to choose at least one. ICAPCD Policy Number 38 has four mitigation measures, from which operators are required to choose at least one. ICAPCD Policy Number 38 contains an option to manage the facility so that lagoons only contain waste from milking parlor and storm water as a mitigation measure. District Rule 4570 does not contain this option. This difference, although worth noting, is not expected to influence the overall effectiveness of District Rule 4570 and District Rule 4570 is as stringent as ICAPCD Policy Number 38.

Manure Land Application Mitigation Measures

District Rule 4570 has two mitigation measures that are mandatory if applicable. Imperial County APCD policy has a menu of five mitigation measures from which operators are required to choose two. Since two measures are required by both ICAPCD Policy Number 38 and District Rule 4570, they will be considered identical under this category.

Requirements for Beef Feedlot CAFs

Animal Housing Mitigation Measures

District Rule 4570 has nine mitigation measures, six of which are mandatory. The facility is also required to choose one additional mitigation measure from the remaining three. ICAPCD Policy Number 38 has nine mitigation measures, from which facilities are required to choose at least four. Since operators in Imperial County are required to implement fewer mitigation measures, District Rule 4570 is more stringent.

For three of the mitigation measures, the compliance times differ between the District rule and ICAPCD Policy Number 38. For these measures, ICAPCD Policy Number 38 allows longer time periods between repeated performances of the measures than District Rule 4570. For these three mitigation measures, the District rule is more stringent because the District Rule 4570 requires repeated performance of the otherwise identical mitigation measures in shorter time periods.

For two of the mitigation measures, the maximum depth of manure differs significantly between the District Rule 4570 and ICAPCD Policy Number 38. For these measures, ICAPCD Policy Number 38 allows manure depths that are deeper than allowed by District Rule 4570. For these two mitigation measures, District Rule 4570 rule is more stringent because the District Rule 4570 requires shallower manure depths for otherwise identical mitigation measures.

Solid Waste and Separated Solids Mitigation Measures

District Rule 4570 has two solid waste and separated solids mitigation measures, from which operators are required to choose at least one. ICAPCD Policy Number 38 has four mitigation measures from which facilities are required to choose at least one. Therefore, both rules are identical in this category.

ICAPCD Policy Number 38 policy requires that manure piles are covered year round whereas District Rule 4570 requires that the piles be covered from October through May – the months the months in the San Joaquin Valley in which rainfall is most likely. However, because of the greater depth of manure allowed in corrals and increased duration (up to two years) for removal of manure from the corrals allowed by ICAPCD Policy Number 38, CAFs in the ICAPCD are able to allow manure to accumulate in the corrals until it can be hauled offsite. Few, if any, CAFs in the ICAPCD are expected to actually store manure onsite outside of corrals, so it is likely than no facilities in ICAPCD are actually choosing and implementing this measure. Overall District Rule 4570 is as stringent as ICAPCD Policy Number 38.

Liquid Manure Handling

ICAPCD Policy Number 38 does not address liquid manure handling for beef feedlot operations. This is likely because beef feedlot facilities in ICAPCD do not generally use liquid manure management systems. District Rule 4570 requires one measure to be selected out of a menu of options, if applicable. Therefore, Rule 4570 is more stringent in this category.

Manure Land Application Mitigation Measures

District Rule 4570 has two mitigation measures that are mandatory if applicable. ICAPCD Policy 38 has a menu of five mitigation measures from which operators

are required to choose two. Since two measures are required by both ICAPCD Policy Number 38 and District Rule 4570, they will be considered identical under this category.

Requirements for Other CAFs

In the same manner as for dairy and beef feedlot operations, District Rule 4570 specifies mitigation methods for confined animal facilities other than dairies and beef feedlots. ICAPCD Policy 38 only has mitigation measures for dairy and beef feedlot operations. In comparing the two documents, District Rule 4570 is therefore more comprehensive and stringent.

Requirements – Suspension and Substitution of Mitigation Measures

District Rule 4570 and ICAPCD Policy 38 allow for substitution of one mitigation measure with an equivalent or more stringent one with the submission of the appropriate application. District Rule 4570 also allows the temporary suspension of a mitigation measure upon the determination by a certified veterinarian or nutritionist that such a suspension is necessary for animal health purposes. The District must be notified within 48 hours, and a new measure must be implemented if the suspension is expected to last longer than 30 days. ICAPCD Policy 38 allows for temporary suspension of mitigation measures under circumstances similar to District Rule 4570. Based on the discussion, Rule 4570 is as stringent as ICAPCD Policy 38.

Testing, Monitoring, Recordkeeping Requirements

District Rule 4570 requires records to be maintained and retained for at least five years, whereas ICAPCD Rule 217 requires records to be retained for two years. District Rule 4570 therefore has a more stringent record retention requirement.

District Rule 4570 requires facilities not subject to the mitigation measure requirements to maintain sufficient records to demonstrate their exemption status. Facilities subject to the mitigation measure requirements must maintain sufficient records to demonstrate implementation of each mitigation measure selected. Facilities must also maintain animal population records. ICAPCD Rule 217 requires the maintenance of animal population records but does not require specific records needed to demonstrate implementation of each mitigation measure selected. District Rule 4570 is therefore more stringent in the type of records required to be maintained.

Conclusion – Comparison with Imperial County APCD Rule 217 and Imperial County APCD Policy Number 38

ICAPCD Rule 217 requires operators of large CAFs to implement the control measures identified in their emissions mitigation plan, which may be selected from the ICAPCD Policy Number 38, Recommended Mitigation Measures for Large

Confined Animal Facilities; however, compliance with ICAPCD Policy Number 38 is not explicitly required by the rule. District Rule 4570 contains several mandatory mitigation measures, unlike the optional nature of the mitigation measures in Imperial County APCD Rule 217. District Rule 4570 also has a lower applicability threshold for dairies (500 milk cows). In addition, ICAPCD Policy Number 38 only lists mitigation measures for dairy operations and beef feedlot operations while District Rule 4570 covers additional CAFs (swine, chicken layer, chicken broiler, duck and turkey, and other CAFs). As shown the discussion above, District Rule 4570 is far more stringent than ICAPCD Rule 217 and ICAPCD Policy Number 38.

G. Butte County AQMD (BCAQMD) Rule 450 – Large Confined Animal Facilities

Butte County AQMD Rule 450 is a permits rule. It outlines, in general terms, the requirements for a complete permit application and how the staff would evaluate and approve/disapprove the permit application.

Applicability/Exemption/Large CAF Definition

Butte County AQMD Rule 450 was adopted on December 21, 2006 and has since not been amended.

BCAQMD adopted ARB's definition of large CAF. District Rule 4570 defines large CAFs the same way except for large CAFs for horses. District Rule 4570 defines a large CAF for horses as having at least 3,000 head, whereas BCAQMD Rule 450 defines a large CAF for horses as having at least 2,500 head. There are currently no CAFs in the San Joaquin Valley with the capacity to house at least 2,500 horses and no CAFs for horses in the San Joaquin Valley are expected to exceed this threshold in the foreseeable future.

In addition to applying to large CAFs, District Rule 4570 lowers the applicability thresholds for the following CAFs:

- Dairies – from 1,000 milk cows to 500 milk cows
- Broilers/Ducks and Layers – from 650,000 birds to 400,000 birds

Therefore, Rule 4570 is more stringent regarding applicability.

CAF Requirements

BCAQMD Rule 450 requires large CAFs to obtain a permit and to submit and implement a mitigation plan; however, the rule does not list mitigation measures or specify the number of mitigation measures required. District Rule 4570 has a menu of specific mitigation measures and stipulates the number of mitigation measures an operator is required to implement. In this regard, District Rule 4570 is more stringent than the BCAQMD Rule 450.

Testing, Records, and Reporting Requirements

BCAQMD Rule 450 requires that all CAFs record the daily number of animals on-site. These records are to be kept on-site for two years and presented if requested. District Rule 4570 requires testing and records be kept to demonstrate compliance with the operator's selected mitigation measures. The records are to be kept for five years and presented upon the request of EPA or the District. Because District Rule 4570 covers testing, as well as having a longer record retention time, it is more stringent than BCAQMD Rule 450.

Conclusion – Comparison with Butte County AQMD Rule 450

District Rule 4570 contains specifies the actual mitigation measures that facilities are required to implement. In addition, District Rule 4570 has lower applicability thresholds for dairies, chicken facilities, and duck facilities. As shown in the discussion above, District Rule 4570 is more stringent than BCAQMD Rule 450.

H. **Idaho Administrative Procedure Act (IDAPA) 58.01.01 Sections 760-764: Rules for the Control of Ammonia from Dairy Farms**

Applicability/Exemption

IDAPA 58.01.01 Sections 760-763 was adopted on March 30, 2007 and IDAPA 58.01.01 Subsection 764.02: Table – Ammonia Control Practices for Idaho Dairies was last amended on May 8, 2009.

Pursuant to IDAPA 58.01.01 Section 761, Sections 760-764 apply to dairies of the following sizes. The thresholds are based on estimating the number of cattle required to produce 100 ton of ammonia annually. Different thresholds are given for drylot dairies, dairies with scraped freestalls, and dairies with flushed freestalls. The thresholds are given on the basis of Animal Units (AU) (1,000 lbs of live weight) and on a mature cow equivalent basis (1,400 lbs of live weight).

SUMMARY: Animal Unit (AU) or mature cow threshold to produce 100 ton NH₃/year

Animal Unit (AU) Basis	Drylot	Free Stall/Scrape	Free Stall/Flush
	AU (100 t NH ₃) Threshold		
No land app	7,089	3,893	2,293
27% volatilization ¹	6,842	3,827	
80% volatilization ²	6,397	3,700	
	Total Cows (100 t NH ₃) Threshold		
Cow Basis (1,400 lb)	Drylot	Free Stall/Scrape	Free Stall/Flush
No land app	5,063	2,781	1,638

27% volatilization ¹	4,887	2,733	
80% volatilization ²	4,589	2,643	
No land app	5,063	2,781	

1 Assumes expected level of N->NH₃ volatilization for drop-hose or ground level liquid manure application.

2 Assumes expected level of N->NH₃ volatilization for center pivot or other conventional sprinkler irrigation liquid manure application

The smallest dairy to which IDAPA 58.01.01 Sections 760-764 applies would have the equivalent of at least 1,638 mature cows in flushed freestalls and a larger number of animals in scraped freestalls or corrals. In comparison, District Rule 4570 applies to dairy CAFs with at least 500 milking cows (at least 700 AU or 500 mature cows). In addition, District Rule 4570 applies to other types of confined animal facilities, including beef cattle feedlots, other cattle facilities, poultry facilities, and swine facilities. Therefore, District Rule 4570 is more stringent regarding applicability.

Requirements for Dairies

Each dairy farm subject to IDAPA 58.01.01 Sections 760 - 764 must employ Best Management Practices (BMPs) for the control of ammonia. The BMPs are applied to the following systems at a dairy: Waste Storage and Treatment Systems, General Practices, Freestall Barns, Open Lots and Corrals, Animal Nutrition, Composting Practices, and Land Application. A total of twenty-seven (27) points must be achieved for the BMPs employed. The table located in Subsection 764.02 lists the approved BMPs and their associated point values. During development of the regulation, a point system with a maximum of 20 points was assigned to each practice. A practice receiving 20 points equates to a system or practice that is considered to result in major reduction in ammonia emissions for that specific process. However, according to the supporting documentation, this point system is “arbitrary”.^[27] Therefore, there is no direct correlation from the points required and the amount of emission reductions achieved. In fact, due to the flexibility allowed in this rule, even if all points have been met by the rule and depending on which mitigation measures are selected, the overall ammonia emission reductions may not be substantial. The Idaho Department of Environmental Quality (DEQ) may also determine a practice not listed in the table constitutes a BMP and assign a point value. Points may also be obtained through third party export with sufficient documentation.

The paper Commentary: Ammonia-Based Air Quality Permits for Idaho Dairies^[28] indicated that “Solid separation of manure, corral harrowing, low-pressure

^[27] Idaho Department of Environmental Quality (2006). Scientific Basis for the Control of Ammonia from Dairy Farms Best Management Practices 7/18/2006 by Ron E. Sheffield, Waste Management Engineer, University of Idaho and Bruce Louks, Air Quality Division, Idaho Department of Environmental Quality. http://www.deq.idaho.gov/media/635665-58_0101_0502_scientific_basis_final.pdf

^[28] Sheffield, R. E. and Louks, B. (2008). COMMENTARY: Ammonia-Based Air Quality Permits for Idaho Dairies. Environmental Practice, 10, pp 13-19. doi:10.1017/S1466046608080046. <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=1888928>

irrigation, composting, and rapid manure removal from outdoor lots were found to be the most common BMPs.”

Solids Separation

In the Idaho regulation, solids separation refers to “gravity or mechanical separation system to remove manure solids from liquid waste stream.” This practice has been implemented by almost all dairies in the San Joaquin Valley subject to District Rule 4570 to comply with the liquid manure mitigation measure requirements of District Rule 4570.

Corral Harrowing/Cleaning

In the Idaho regulation corral harrowing refers to harrowing to distribute deposited manure, reshape corral surface, and/or remove manure from corral surface and rapid manure removal from outdoor lots refers to the removal of winter time manure and corral bedding from open lot surface in spring or as quickly as practicable. District Rule 4570 has much more stringent requirements for corral cleaning and maintenance at dairies. For corrals, District Rule 4570 requires dairies to implement the following measures: a) Cleaning manure from corrals at least four times per year with at least 60 days between cleaning or b) cleaning corrals at least once between April and July and at least once between September and December; and a) Scraping, vacuuming, or flushing concrete lanes in corrals at least once every day for mature cows and every seven days for support stock, or b) Cleaning concrete lanes such that the depth of manure does not exceed twelve inches at any point or time; and inspection of water pipes and troughs and repairing leaks at least once every seven days; and a) Sloping the surface of the corrals at least 3% where the available space for each animal is 400 square feet or less and Sloping the surface of the corrals at least 1.5% where the available space for each animal is more than 400 square feet per animal, or b) Maintaining corrals to ensure proper drainage preventing water from standing more than forty-eight (48) hours, or c) Harrowing, raking, or scraping corrals sufficiently to maintain a dry surface. In addition, District Rule 4570 requires dairies to choose an additional corral mitigation measure, requiring corrals to be managed such that the manure depth in the corral does not exceed twelve inches at any time or point, except for in-corral mounding. Therefore, the corral cleaning and maintenance requirements of District Rule 4570 are far more stringent than IDAPA 58.01.01 Sections 760 – 764.

Previous emission studies conducted in the San Joaquin Valley have demonstrated that the corrals and pens are the sources with the greatest potential for NH₃ emissions on San Joaquin Valley dairies^[29] and, therefore, the much more stringent corral cleaning and maintenance measures required by District Rule 4570 have the potential for far greater NH₃ reductions.

^[29] See: Schmidt, C. and Card, T. (2006) Dairy Air Emissions Report: Summary of Dairy Emission Estimation Procedures (May 2006). Final Report to California Air Resource Board (ARB).
<http://www.arb.ca.gov/ag/caf/SchmidtDairyEmissions2005.pdf>
<http://www.arb.ca.gov/ag/caf/SchmidtDairyTestData2005.pdf>

Liquid Manure Application

In the Idaho regulation, Low Energy/Pressure Application Systems refers to use of center pivot and liner-move irrigation strategy that applies liquids at low pressures using drop nozzles. The guidance for the regulation states that larger droplets result in lower emissions but may cause infiltration problems on some soils. The use of center pivot and liner-move irrigation to apply liquid manure is very uncommon in the San Joaquin Valley and may be prohibited in the use permits for many dairies. In the San Joaquin Valley it is much more common to apply liquid manure to cropland through flood or furrow irrigation after it has been diluted with fresh irrigation water as generally required by either the Water Quality Board or the local County and as a means to avoid damage to growing crops. Because of the reduced surface area, flood and furrow irrigation have even lower emissions than low pressure sprinkler irrigation systems. Dilution of the liquid manure with fresh irrigation water further reduces NH₃ emissions and is also listed as a BMP in the Idaho regulation. Therefore, the liquid manure practices utilized in the San Joaquin Valley are more stringent than the Idaho regulation.

Composting

In the Idaho regulation “composting” refers to stacking and drying of separated manure solids or corral manure. Almost all dairies in the San Joaquin Valley utilize this practice to prepare solid manure and/or separated solids for bedding and/or for use on cropland. In addition, District Rule 4570 requires that dairies implement one of the following measures for solid manure or separated solids: 1) within 72 hours of removal from housing, either: a) Remove dry manure from the facility, or b) Cover dry manure outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed 24 hours per event; or 2) Within seventy-two hours of removal from the drying process, either: a) Remove separated solids from the facility, or b) Cover separated solids outside the housing with a weatherproof covering from October through May, except for times when wind events remove the covering, not to exceed twenty-four 24 hours per event. Therefore, the general management practices conducted on dairies in the San Joaquin Valley and the requirements of District Rule 4570 are far more stringent than the Idaho regulation.

For dairy corrals, which are the largest source of NH₃ emissions at dairies in the San Joaquin Valley, District Rule 4570 requires more stringent mitigation measures and a greater number of these measures. District Rule 4570 is also more specific in regards to mitigation measures required from other processes at dairies and the number of mitigation measures that must be implemented for each process; as a result, District Rule 4570 is able to better target the reduction of emissions from these different operations. Therefore, District Rule 4570 is more stringent than IDAPA 58.01.01 Sections 760 - 764.

Requirements for Other Confined Animal Facilities

As stated above, District Rule 4570 provides specific mitigation measures for

beef cattle feedlots, other cattle facilities, poultry facilities, and swine facilities. IDAPA 58.01.01 Sections 760-764 does not address mitigation measures for these additional categories. Therefore, District Rule 4570 is more stringent for this category.

Requirements – Suspension and Substitution of Mitigation Measures

IDAPA 58.01.01 Subsection 762.03 provides that if a dairy farm not subject to Sections 760 - 764 would become subject to these regulations as a result of an emergency (for example if a dairy farmer takes additional cows due to unforeseen circumstances), the dairy farm must notify the Idaho Department of Environmental Quality (DEQ) in writing within 14 days explaining the emergency circumstances. The dairy farm would be exempt from these requirements for up to one year as long as the consequences of the emergency continue. In the event of unforeseen equipment upsets and breakdowns, so long as corrective action is taken within a reasonable time, the event does not reduce the BMP point value.

In comparison, District Rule 4570 allows an operator to temporarily suspend any mitigation measure as long as the suspension is recommended by a licensed veterinarian or animal nutritionist on the basis of animal health. The operator must notify the District within 48 hours prior to the suspension. If the suspension is expected to last longer than 30 days, then the operator must submit a new mitigation plan that identifies a new mitigation measure to be implemented in place of the suspended one.

District Rule 4570's exemption under this category is much more stringent because it is a temporary suspension that cannot exceed 30 days, whereas the IDAPA 58.01.01 Sections 760-764 exemption may last much longer, without any requirement to substitute another measure.

Therefore, in this category of mitigation measure suspensions/substitutions, District Rule 4570 is more stringent than IDAPA 58.01.01 Sections 760-764.

Testing, Monitoring, Recordkeeping Requirements

Compliance with the requirements of IDAPA 58.01.01 Sections 760-764 is primarily determined by inspections by the Idaho State Department of Agriculture. The Idaho regulations do not specify what records must be kept or have any requirement that the records be maintained for a certain period of time.

District Rule 4570 includes specific requirements for monitoring, source testing as appropriate and recordkeeping to ensure mitigation measure are being implemented. Facilities must also maintain animal population records. District Rule 4570 also requires facilities not subject to the mitigation measure requirements to maintain sufficient records to demonstrate their exemption

status. District Rule 4570 requires records be retained for five years for all sources. District Rule 4570 is therefore more stringent in this area.

Conclusion – Comparison with IDAPA 58.01.01 Sections 760 - 764

For dairy facilities, District Rule 4570 is far more stringent than IDAPA 58.01.01 Sections 760-764. Unlike IDAPA 58.01.01 Sections 760-764, District Rule 4570 requires specific practices for the various operations at dairies. District Rule 4570 also provides specific mitigation measures for beef cattle feedlots, other cattle facilities, poultry facilities, and swine facilities, while IDAPA 58.01.01 Sections 760-764 does not. The measures required by the Idaho regulation are also based on an arbitrary point system and as such do not guarantee a specific degree of control. District Rule 4570 is, therefore, more stringent than IDAPA 58.01.01 Sections 760-764.

IV. Conclusion:

After careful evaluation of federal rules and regulations as well as prohibitory rules in other areas, District staff concludes that District Rule 4570 satisfies RACT for NH₃ emissions from Confined Animal Facilities. This conclusion is supported by the fact that EPA previously determined that District Rule 4570 satisfied RACT for VOC emissions from Confined Animal Facilities and many of the same measures will also limit NH₃ emissions from these facilities. The District also evaluated the feasibility of additional ammonia emissions reductions. However, the District has not identified any additional reasonable measures. In fact, the South Coast Air Quality Management District recently identified District Rule 4570 as the most stringent rule for this source category in their ozone Reasonably Available Control Technology Demonstration.³⁰

A.2 Agricultural Fertilizers

Farms have continued to improve methods of fertilizer application over the years to maximize nitrogen use efficiency and minimize environmental impacts. Best management practices are being implemented to minimize nitrate leaching in irrigated crop production. Researchers at UC Cooperative Extension have been studying the nitrogen use efficiency for various crop types and have begun identifying the point at which the application of additional nitrogen no longer significantly increases crop quality and yields. This will allow growers to apply fertilizer with more precision to reduce the amount of nitrogen left in the soil.

Agricultural operations in California are regulated by the State Water Resources Control Board, which is charged by the state Legislature in enforcing state and federal water quality protection laws. The State Water Resources Control Board consists of Regional

³⁰ South Coast Air Quality Management District (June 6, 2014). Reasonably Available Control Technology Demonstration. <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2014/2014-jun6-031.pdf?sfvrsn=2>

Water Quality Control Boards (Regional Boards) that develop objectives and plans to protect the beneficial uses of water, recognizing local differences in climate, topography, geology and hydrology. All dairy farms in California's Central Valley are regulated by the Central Valley Regional Water Quality Control Board ("Regional Board"). The vast majority of dairies - about 1,200 dairies are regulated under a Regional Board General Order³¹ and the remainder are regulated via individual orders that ensure compliance with the same requirements. These requirements include:

- A Nutrient Management Plan (NMP), prepared by a certified professional crop advisor or equivalent, designed to control nutrient losses for protection of surface water and groundwater;
- A Waste Management Plan (WMP), prepared by a licensed engineer;
- Environmental sampling and monitoring of soil, manure, water and plant tissue for compliance;
- Routine site inspections, record-keeping, and reporting; and
- Additional groundwater monitoring to assess ongoing water quality protection

A major purpose of these regulations is to ensure responsible storage and use of manure as an important crop fertilizer and soil builder, thus preventing unnecessary runoff or leaching of nitrogen compounds to the environment, where they can impact water quality. The NMP is designed to assure that the amount of nitrogen excreted by milking cows and support stock is in reasonable balance with the needs of crops grown at the dairy farm. Manure nitrogen in excess of crop needs should be exported off the farm to where it can be used by other farmers. Nitrogen used on the farm is required to be stored safely until it is used (the major purpose of the WMP) and then only applied to agricultural fields when needed for crop growth and in the amounts needed. Over-application or mistimed application of nitrogen fertilizers can result in unnecessary losses of nitrogen to the environment, both as seepage below the root zone (in the form of nitrate or other nitrogen compounds)³² or as air emissions of ammonia gas, ammonium, and oxides of nitrogen.

The University of California suggested in 2005 that "... optimal N loading rates of 1.4 to 1.65 times the crop N harvest removal are practical and, based on field observations, achievable if the production field is properly managed."³³ The UC assessment was the ultimate basis for performance standards set by the Regional Board in the General Order, which was adopted in 2007 and revised and re-issued in 2013.

Research suggests that to achieve the more stringent targets in the General Order, many dairies had to greatly increase the precision of their manure and fertilizer applications, while also reducing the overall amount of nitrogen applied to their crops compared to plant uptake.³⁴ On a group of San Joaquin Valley dairy farms, it was estimated that prior to adoption of the General Order in 2007, losses of nitrogen to groundwater alone ranged from 370 to 570 pounds per acre compared to 500 pounds of

³¹ http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0122.pdf

³² See "Managing Dairy Manure in the Central Valley of California," published by the University of California Committee of Experts on Dairy Manure Management, 2005. <http://groundwater.ucdavis.edu/files/136450.pdf>

³³ *Ibid.*, p. 47

³⁴ "Cow Numbers and Water Quality – is there a magic limit?" (Harter, Menke 2005), <http://groundwater.ucdavis.edu/files/136451.pdf>

uptake by crops.³⁵ Similar or larger amounts of nitrogen are expected to volatilize to the atmosphere as ammonia and other compounds following excretion of manure from animals, during storage of manure in ponds or corrals, and in the process of applying manure to soil as a crop nutrient.³⁶ Thus, as a result of full implementation of the General Order, losses of nitrates to groundwater on dairies may be reduced by up to 85 percent compared to pre-General Order conditions, though this number will be smaller for dairies where manure was managed more precisely prior to the General Order's adoption.

Increasing crop nutrient uptake is also expected to reduce air emissions by providing for application of less excess fertilizer to crops, and therefore, less opportunity for volatilization in the fields. Some research already conducted found lower emissions with moderate nitrogen applications and suggested "synchronizing N applications with crop N demand. Once the N requirement for each crop stage is known, the N applications can be adjusted accordingly. This strategy should lead to improved N use efficiency and likely lower N₂O emissions."³⁷

Other nitrogen compounds such as ammonia can also volatilize to air during application to fields. The University of California Committee of Experts on Dairy Manure Management has suggested that during application of manure water to crops, significant ammonia emissions can occur when manure water is not properly diluted (to below 100 ppm NH₃/N) or applied during early growth of the crop. However, "in systems with frequent, but well diluted manure water applications, ammonia losses from the ground surface will commonly be minimal during the irrigation (10% or less)."³⁸

Although additional research will be helpful in quantifying the environmental benefits of improved waste management and nutrient applications, the weight of evidence suggests that managing nutrient applications to fields as prescribed in the General Order, especially compared to pre-General Order management on some dairy farms, has significantly reduced losses of nitrogen compounds to the environment, including leaching of nitrogen compounds to groundwater and air emissions such as ammonia and nitrous oxide.

A.3 Organic Material Composting (District Rule 4566)

I. District Rule Description:

District Rule 4566 (Organic Material Composting) is the most stringent rule in the nation for controlling emissions from composting operations; additional controls are infeasible. Additionally, as discussed in Chapter 7 of the *2012 PM_{2.5} Plan*, one of the technology focus areas for the District's Technology Advancement Program is for waste

³⁵Ibid., Harter.

³⁶Ibid., "Managing Dairy Manure in the Central Valley of California."

³⁷"Assessment of Nitrous Oxide Emissions in California's Dairy Systems, DRAFT FINAL REPORT, California Air Resources Board, Contract No. 09-325, William R. Horwath, Martin Burger, Stuart Pettygrove, <http://www.arb.ca.gov/research/rsc/10-18-13/item6dfr09-325.pdf>

³⁸Ibid., "Managing Dairy Manure in the Central Valley of California," p. 41.

solutions that focus on waste systems or technologies that minimize or eliminate emissions from existing waste management systems and processes, including waste-to-fuel systems, such as dairy digesters and other bio-fuel applications. The District has taken every regulatory action feasible to reduce emissions from this source and continues to seek additional methods to reduce emissions through innovative strategies such as the support of research and technology demonstrations with potential to reduce emissions further.

District Rule 4566, was adopted on August 18, 2011, to limit volatile organic compounds (VOC) emissions from composting facilities whose feedstock consists of greenwaste and/or foodwaste. District Rule 4566 applies to operations that stockpile and compost greenwaste and foodwaste. In addition to limiting VOC emissions, District Rule 4566 also limits ammonia (NH₃) emissions from these operations. The analysis below focuses on how District Rule 4566 limits NH₃ emissions in comparison to other rules and regulations.

II. How does District Rule 4566 compare with federal rules and regulations?

A. EPA-Control Technique Guidelines (CTG)

There is no EPA CTG guidance document for greenwaste or foodwaste composting operations.

B. EPA - Alternative Control Technology (ACT)

There is no EPA ACT guidance document for greenwaste or foodwaste composting operations.

C. Standards of Performance for New Stationary Sources (NSPS)

There is no NSPS guidance document for greenwaste or foodwaste composting operations.

D. National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

There is no NESHAP guidance document for greenwaste or foodwaste composting operations.

III. How does District Rule 4566 compare to rules in other air districts?

District staff compared District Rule 4566 with the rules for greenwaste and foodwaste composting operations from other California air districts. The results of the analysis are discussed below. District staff only located one other air district rule that applied to similar sources: South Coast Air Quality Management District (SCAQMD) Rule 1133.3. No other air district rules that applied to greenwaste or similar sources were found.

A. South Coast Air Quality Management District (SCAQMD) Rule 1133.3 - Emission Reductions from Greenwaste Composting Operations (Adopted July 8, 2011)

The purpose of SCAQMD Rule 1133.3 is to reduce emissions of volatile organic compounds (VOC) and ammonia (NH₃) from greenwaste and foodwaste composting operations. The table below compares the significant similarities and differences between SJVAPCD Rule 4566 and SCAQMD Rule 1133.3. For purposes of this analysis, the ammonia control efficiencies achieved by the requirements of SJVAPCD Rule 4566 are assumed to be the same as the VOC control efficiencies since the same control measures will reduce both VOC and NH₃ from these operations. It is worth noting that greenwaste/foodwaste composting produces about 16% of the ammonia emissions on a per ton basis compared to co-composting.³⁹

³⁹ SCAQMD Rule 1133.3, baseline NH₃ emissions from greenwaste/foodwaste composting = 0.46 lb-NH₃/ton-throughput. SCAQMD Rule 1133.2, baseline NH₃ emissions from co-composting = 2.93 lb-NH₃/ton-throughput.

Rule Section	SCAQMD Rule 1133.3	SJVUAPCD Rule 4566	Explanation of Differences
Applicability	New and existing greenwaste and foodwaste composting operations.	New and existing organic material composting and stockpiling facilities. (Organic material is defined as green material, food material, or mixtures of the two, with <100 ton/yr biosolids or manure.)	SCAQMD Rule 1133.3 limits foodwaste stockpiling time (48 hr), whereas SJVAPCD Rule 4566 limits organic material stockpiling time (3 or 10 days, depending on throughput).
Exemptions	Applicability/exemptions based on facility type, not throughput.	Applicability/exemptions based on facility type, not throughput.	The same types of facilities are exempt in both rules: facilities subject to a co-composting rule (SCAQMD Rule 1133.2 or SJVAPCD Rule 4565, nursery, household, recreational, and community composting facilities. SJVAPCD Rule 4566 also exempts agricultural facilities which are subject to SJVAPCD Rule 4204, 4550, or 4570.
Composting Control Requirements	<ul style="list-style-type: none"> • ≤5,000 ton/yr foodwaste or ≤20% manure (watering and finished compost cover or ≥20% control for NH₃) • >5,000 ton/yr foodwaste, (emission control device with ≥80% control for NH₃) 	<ul style="list-style-type: none"> • <200,000 ton/yr organic material (watering system or ≥19% control for NH₃), • ≥200,000 and <750,000 ton/yr organic material (watering system and finished compost cover or ≥60% control for NH₃) • ≥750,000 ton/yr organic material (emission control device with ≥80% control for NH₃) 	The throughput/control levels in Rule 4566 are based on cost-effectiveness and socio-economic studies conducted by the District as part its Final Staff Report Revised Proposed New Rule 4566 (Appendices C and D, August 18, 2011). Rule 4566 requires the same management practices and control requirements as Rule 1133.3; however, the throughput levels at which the stricter control requirements in Rule 4566 become triggered are much higher than in Rule 1133.3. Thus, on paper, Rule 1133.3 appears to be more stringent than Rule 4566. However, SCAQMD does not have any greenwaste composting facilities (that are not under an experimental research permit) subject to the 80% control requirements of Rule 1133.3.

As shown in the table above, based on discussions with SCAQMD permitting and rule development staff, SCAQMD does not have any greenwaste composting production facilities subject to the 80% ammonia reduction requirement of Rule 1133.3. SCAQMD has recently issued Authority to Construct permits for two *experimental research* greenwaste composting facilities located in Fontana and Riverside operated by Burrtec. The permits authorize Burrtec to perform greenwaste composting for one year (with the possibility of an extension) in order to evaluate the feasibility of three different compost emissions control technologies and conduct emissions testing for each technology. If at the end of the permitted experimental research period, Burrtec wanted to convert one or

both facilities into a regular greenwaste composting production facility, they would need to obtain new ATC permits. The Burrtec facilities then are not representative of a commercial production greenwaste composting facility.

RACT is generally understood to apply to existing sources. Because SCAQMD has no existing production greenwaste composting facilities that are subject to the 80% ammonia control requirement of Rule 1133.3, and the new facilities are permitted under experimental research exemptions, then Rule 1133.3 cannot be used to establish RACT as 80% for that category/throughput level of greenwaste composting. Moreover, the types of controls that will meet the 80% requirement are considered equivalent to Best Available Control Technology (BACT) for composting sources,⁴⁰ which is a higher level of control than RACT. Therefore, SCAQMD exceeds RACT requirements.

B. No rules that apply to biosolids, animal manure, and/or poultry litter operations were located for the air districts listed below

- Amador County Air Pollution Control District (ACAPCD)
- Bay Area Air Quality Management District (BAAQMD)
- Eastern Kern County Air Pollution Control District (EKAPCD)
- El Dorado County Air Quality Management District
- Imperial County Air Pollution Control District (ICAPCD)
- Mojave Desert Air Quality Management District (MDAQMD)
- North Coast Unified Air Quality Management District (NCAQMD)
- Placer County Air Pollution Control District (PCAPCD)
- Sacramento Metropolitan Air Quality Management District (SMAQMD)
- San Diego County Air Pollution Control District (SDCAPCD)
- Ventura County Air Pollution Control District (VCAPCD)
- Yolo-Solano Air Quality Management District (YSAQMD)

C. Idaho Administrative Procedure Act (IDAPA) 58.01.01 Sections 760-764: Rules for the Control of Ammonia from Dairy Farms

The purpose of IDAPA 58.01.01 Sections 760-764 is to set forth requirements for the control of ammonia through best management practices (BMPs) for certain size dairy farms licensed by the Idaho State Department of Agriculture to sell milk for human consumption.

This regulation only applies to large dairies and does not apply to other agricultural facilities or facilities in which the primary activity is the production of compost. Therefore, it was determined that this regulation is not relevant to the current analysis since it does not specifically limit emissions from composting facilities.

⁴⁰ SJVAPCD BACT Clearinghouse Guideline 6.4.9, Co-Composting Operation.

Conclusion

After careful evaluation of federal rules and regulations as well as prohibitory rules in other California areas, District staff concludes that District Rule 4566 satisfies RACT for ammonia emissions from greenwaste and foodwaste composting operations.

A.4 Biosolids, Animal Manure, and Poultry Litter Operations (District Rule 4565)

I. District Rule Description:

District Rule 4565, was adopted on March 15, 2007, to limit volatile organic compounds (VOC) emissions from facilities whose throughput consists entirely or in part of biosolids, animal manure, or poultry litter. District Rule 4565 applies to operations that landfill, land apply, compost, or co-compost these materials. In addition to limiting VOC emissions, District Rule 4565 also limits ammonia (NH₃) emissions from these operations. The analysis below focuses on how District Rule 4565 limits NH₃ emissions in comparison to other rules and regulations.

II. How does District Rule 4565 compare with federal rules and regulations?

A. EPA-Control Technique Guidelines (CTG)

There is no EPA CTG guidance document for biosolids, animal manure, and/or poultry litter operations.

B. EPA - Alternative Control Technology (ACT)

There is no EPA ACT guidance document for biosolids, animal manure, and/or poultry litter operations.

C. Standards of Performance for New Stationary Sources (NSPS)

There is no NSPS guidance document for biosolids, animal manure, and/or poultry litter operations.

D. National Emission Standards for Hazardous Air Pollutants (NESHAPs) and Maximum Achievable Control Technologies (MACTs)

There is no NESHAP guidance document for biosolids, animal manure, and/or poultry litter operations.

III. How does District Rule 4565 compare to rules in other air districts?

District staff compared District Rule 4565 with the rules for biosolids, animal manure, and poultry litter operations from other California air districts. The results of the analysis are discussed below. District staff only located one other air district rule that applied to

similar sources, South Coast Air Quality Management District (SCAQMD) Rule 1133.2. No other air district rules that applied to similar sources were found.

A. South Coast Air Quality Management District (SCAQMD) Rule 1133.2 - Emission Reductions from Co-Composting Operations (Adopted January 10, 2003)

SCAQMD adopted SCAQMD Rule 1133.2. This rule applies to new and existing co-composting operations in the SCAQMD.

Staff notes that there are some differences between District Rule 4565 and SCAQMD Rule 1133.2. This does not mean that one rule is more stringent than the other; rather the differences are due to the following factors:

1. Technology has changed significantly since SCAQMD Rule 1133.2 was adopted on January 10, 2003;
2. Additional research projects regarding mitigation measures have been completed since SCAQMD Rule 1133.2 was adopted; and
3. The socioeconomic climate of the SCAQMD is significantly different from that of the San Joaquin Valley Unified Air Pollution Control District.

The table below summarizes the significant differences between SCAQMD Rule 1133.2 and SJVAPCD Rule 4565. Below are the important differences between the two rules. For purposes of this analysis, the NH₃ control efficiency for the requirements of SJVAPCD Rule 4565 are assumed to be the same as the VOC control efficiency for these requirements since the same measures will generally reduce both VOC and NH₃ from these operations.

Category	SCAQMD Rule 1133.2	SJVAPCD Rule 4565	Reason
Facilities Other Than Co-Composting (Landfilling, Land Applying)	Rule does not apply to these operations	Management practice requirements	Knowledge of control options has increased since Rule 1133.2 adoption and staff believes that cost-effective methods of controlling VOC and NH ₃ emissions from these facilities exist.
Co-Composting Threshold for Applicability	Facilities with at least 1,000 tpy throughput	Facilities that handle 100 tpy or more of biosolids, animal manure, or poultry litter	Staff believes that there are reasonable options that are not exceedingly costly for facilities with throughputs of ≥ 100 tpy that would not impose an undue burden on operators.
Composting Control Requirements	In-vessel composting with 70% control efficiency for VOC and NH ₃ for existing facilities and 80% control efficiency for VOC and NH ₃ for new facilities	Control efficiency of 10% - 80% for VOC (and NH ₃) depending on type of operation and facility throughput	Management practices (mitigation measures) are effective, reasonable, and have been achieved in practice for smaller facilities. In-vessel composting is not cost-effective for smaller or medium facilities and there are no known, unsubsidized facilities in the SCAQMD that would comply with such rule requirements.

It should also be noted that in practice, the facilities that are actually subject to SCAQMD Rule 1133.2 will have much larger throughputs than 1,000 ton per year throughput threshold given in the rule. SCAQMD Rule 1133.2 includes the following exemptions for existing co-composting operations with a design capacity of less than 35,000 tons of throughput per year containing no more than 20 percent biosolids by volume and new and existing municipal facilities using aeration and processing less than 5,000 tons of biosolids or manure per year. In addition many operations in the SCAQMD have found it to be economical to transport these materials to other jurisdictions for processing. An example of this is the Synagro South Kern Compost Manufacturing Facility, which is a newer facility located in the San Joaquin Valley and processes biosolids transported from SCAQMD.

Because some mitigation measures are only cost-effective for larger facilities, SJVAPCD staff developed the concept of Class One and Class Two mitigation measures. Class One mitigation measures are cost-effective options for all facilities, regardless of size. These measures are management practices found to be best practices for all composting operations.

Class Two mitigation measures are the technology options and achieve reductions greater than Class One mitigation measures; however, they were determined to not be cost effective for facilities with throughputs of less than 100,000 wet tons per year.

SJVAPCD Rule 4565 requires reductions from two additional categories (landfilling and land applying) when compared to SCAQMD Rule 1133.2. For the third

category, composting, SJVAPCD staff determined it is not cost effective to require in-vessel (enclosed) composting.

B. No rules that apply to biosolids, animal manure, and/or poultry litter operations were located for the air districts listed below

- Amador County Air Pollution Control District (ACAPCD)
- Bay Area Air Quality Management District (BAAQMD)
- Eastern Kern County Air Pollution Control District (EKAPCD)
- El Dorado County Air Quality Management District
- Imperial County Air Pollution Control District (ICAPCD)
- Mojave Desert Air Quality Management District (MDAQMD)
- North Coast Unified Air Quality Management District (NCAQMD)
- Placer County Air Pollution Control District (PCAPCD)
- Sacramento Metropolitan Air Quality Management District (SMAQMD)
- San Diego County Air Pollution Control District (SDCAPCD)
- Ventura County Air Pollution Control District (VCAPCD)
- Yolo-Solano Air Quality Management District (YSAQMD)

C. Idaho Administrative Procedure Act (IDAPA) 58.01.01 Sections 760-764: Rules for the Control of Ammonia from Dairy Farms

The purpose of IDAPA 58.01.01 Sections 760-764 is to set forth requirements for the control of ammonia through best management practices (BMPs) for certain size dairy farms licensed by the Idaho State Department of Agriculture to sell milk for human consumption.

This regulation only applies to large dairies and does not apply to other agricultural facilities or facilities in which the primary activity is the production of compost. Therefore, it was determined that this regulation is not relevant to the current analysis since it does not specifically limit emissions from composting facilities.

Conclusion

After careful evaluation of federal rules and regulations as well as prohibitory rules in other California areas, District staff concludes that District Rule 4565 satisfies RACT for biosolids, animal manure, and poultry litter operations.

A.5 Major Sources of Ammonia

The facilities listed below were identified as potential major sources of NH₃ in the San Joaquin Valley Air basin. In all cases the NH₃ emissions from the facilities were entirely or primarily the direct result of the use of catalytic emission controls to reduce NO_x emissions to acceptable levels as determined by regulatory agencies including, the US EPA, the California Air Resources Board, the San Joaquin Valley APCD, and, in one

case the California Energy Commission (CEC). Because the San Joaquin Valley Air basin is primarily a rural NO_x-limited area, NO_x reductions are the most critical element of San Joaquin Valley plans to reach attainment with the federal ambient air quality standards for both PM_{2.5} and ozone. Therefore, controls that reduce NH₃ while increasing NO_x would increase the formation of PM_{2.5} and ozone in the San Joaquin Valley and would be detrimental to the goals of reaching attainment with the federal ambient air quality standards.

Facility Name: J.R. Simplot Company; District Facility #C-705

This facility produces fertilizers. The NH₃ emissions from this facility are associated with the Nitric acid production plant at the facility. Although ammonia is used in the production of nitric acid, the vast majority of the ammonia introduced is consumed in the production of the nitric acid or recovered. The ammonia emissions from the nitric acid are the result of the use of a non-selective catalytic reduction (NSCR) system to reduce NO_x emissions from the nitric acid plant. The tail gas from nitric acid plants contains large amounts of NO_x and this plant uses NSCR to reduce NO_x to comply with 40 CFR 60 Subpart G - Standards of Performance for Nitric Acid Plants and Federally-enforceable New and Modified Source Review (NSR) limits. The NSR permit for this facility includes conditions minimizing the allowable amount of NH₃ slip with associated emissions testing. Because the NH₃ emissions are the direct result of the use of NSCR, which is required to comply with Federal NSPS and NSR requirements, and reducing the amount of NH₃ would increase NO_x emissions, this facility is considered to satisfy RACT for NH₃.

Facility Name: Covanta Delano Inc.; District Facility #S-75

This facility is biomass power plant. The NH₃ emissions from this facility are the result of the use of NH₃ injection for Selective Non-Catalytic Reduction (SNCR) to control NO_x from two biomass-fired boilers at the facility. Use of the SNCR to reduce NO_x is required by the EPA-issued Prevention of Significant Deterioration (PSD) Permit PSD ATC SJ 90-01 and Federally-enforceable NSR conditions and also required to comply with 40 CFR 60 Subpart Db—Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units. The NSR permits state, “*Ammonia shall be injected into boiler at a rate, in pounds per ton of biomass fuel introduced into boiler, which results in compliance with the NO_x emission limitation.*” and Permit PSD ATC SJ 90-01 states “... *A SNCR system utilizing ammonia injection shall be incorporated within the boilers. Ammonia shall be injected continuously during all periods of operation at a rate which results in compliance with the NO_x emission limits. ...*” Because a perfect reaction cannot be achieved, some excess NH₃ must be injected in the boiler stacks to reduce NO_x to acceptable levels and this excess unreacted NH₃ escapes the stack as slip. The facility incurs a cost for all of the NH₃ injected into the boiler stacks, so there is an incentive to minimize NH₃ slip to reduce costs associated with compliance with the NO_x limits. In addition, the NSR permits for the biomass-fired boilers include conditions limiting the allowable amount of NH₃ slip.

The NH₃ emissions from the biomass boilers are the direct result of the use of SNCR, which is required by NSR conditions and the EPA-issued PSD Permit PSD ATC SJ 90-

01 and required to comply with the requirements of Federal NSPS. The NSR permits for the biomass-fired boilers include conditions limiting the allowable amount of NH₃ slip with associated emissions testing, and further reducing the amount of NH₃ could potentially increase NO_x emissions; therefore, this facility is considered to satisfy RACT for NH₃.

Facility Name: Northern California Power; District Facility #N-2697

This facility is a natural gas power plant. The NH₃ emissions from this facility are the result of the use of NH₃ injection for Selective Catalytic Reduction (SCR) to control NO_x from two natural gas-fired turbines at the facility. Use of the SCR to reduce NO_x is required by Federally-enforceable NSR conditions and also required to comply with the Federally-enforceable requirements of District Rule 4703 – Stationary Gas Turbines, which is included in the SIP. Because a perfect reaction cannot be achieved, some excess NH₃ must be injected to reduce NO_x to acceptable levels. The excess unreacted NH₃ escapes the stack as slip. The facility incurs a cost for all of the NH₃ injected into the stacks, so there is an incentive to minimize NH₃ slip to reduce costs associated with the compliance with the NO_x limits. In addition, the NSR permits for the natural gas-fired turbines include conditions limiting the allowable amount of NH₃ slip.

The NH₃ emissions from the natural gas-fired turbines are the direct result of the use SCR, which is required by NSR conditions and required to comply with the Federally-enforceable requirements of District Rule 4703. The NSR permits for the natural gas-fired turbines include conditions limiting the allowable amount of NH₃ slip and associated emissions testing, and further reducing the amount of NH₃ could potentially increase NO_x emissions; therefore, this facility is considered to satisfy RACT for NH₃.