Background Report Reference

AP-42 Section Number: 9.9.1

Background Report Section: 2

Reference Number: 31

Title: Letter from Brian Bursiek, American Feed Industry Association, To Dallas Safriet, USEPA

October 1993

Sec. 2 Ref. #31

AFIA

AP-42 Section 9.9.1
Reference
Report Sect. 2
Reference 31

AMERICAN FEED INDUSTRY ASSOCIATION

Dennis
These are the first Comments ~~Som~~ that I have received back so far. I expect more. I have copy. Julia

October 27, 1993

Mr. Dallas W. Safriet
Emission Inventory Branch (MD-14)
Office of Air Quality Planning
and Standards
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

RE: Draft Section 6.9.1, Grain Elevators and Grain Processing Plants, AP-42

Dear Mr. Safriet:

The American Feed Industry Association (AFIA) appreciates the opportunity to submit comments on the Draft Section 6.9.1, Grain Elevators and Grain Processing Plants, Emission Factor Documentation for AP-42. AFIA is the national trade association representing the manufacturers of more than 70% of the primary formula poultry and livestock feed sold annually in the U.S., representing more than 750 companies and 3,000 individual establishments.

AFIA understands, due to the Clean Air Act (CAA) of 1990, AP-42 emission factors will become more universally used and understood by both state and industry as state permit programs are developed and implemented. The feed industry's concerns center on classification of major verses minor sources. Many feed manufacturing facilities do not come close to emitting the volume

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of particulate matter, total suspended particulate (TSP) or particulate matter of 10 microns (PM-10), of sufficient quantities to be classified as major sources. Due to the additional paperwork burden -- permitting, monitoring, testing, and reporting -- required of major sources, AFIA believes the accuracy of section 6.9.1 of AP-42 is extremely critical.

2.0 INDUSTRY DESCRIPTION

2.1.2 GRAIN ELEVATORS

This section describes country and terminal elevators operations, specifically methods of receiving. Many feed mills receive grains and grain by-products in a similar fashion as terminal elevators. Some grain dumps are used, but a high percentage of receiving is via hopper bottom trucks and rail cars. This method allows "choke flow" of the material into the receiving pit, eliminating much of the fugitive dust associated with truck dumps. As new feed mills are built, truck dumps are becoming obsolete.

This difference is critical, as later in section 6.9.1 the tables for emissions associated with feed mill receiving reference elevators in general. AFIA recommends the reference be to terminal elevators, thus reflecting lower and more accurate emission levels. This is properly referenced on Table 4-15, page 4-35, but needs to be correctly referenced in the final text. These levels will be discussed in more detail later in these comments.

2.2.2.6 ANIMAL FEED MILLS

The first paragraph on page 2-52 fails to point out the differences in methods of receiving as mentioned above. Although all of the methods described are used, the majority of ingredients received are from hopper bottom trucks and rail cars. This significantly reduces emissions due to "choke flow." AFIA recommends this method of receiving be reflected in the process description. Box cars, power shovels and boxcar unloaders are not universally used, as these can be sources of high emissions.

Figure 2-13; Typical Feed Milling Process Flow Diagram on page 2-53, lists several emission sources. AFIA disagrees that these points are, in all cases, PM emission sources. Unlike mill construction of 25 years ago, contemporary equipment is connected with closed spouting and turnheads, covered drag and screw conveyors, and tightly sealed transitions between adjoining equipment. Many older facilities have undergone renovations over the years, and likewise have upgraded to "closed systems." This flow diagram identifies emission sources at points of loading or discharging of conveyors. Today's installations are tightly sealed to eliminate these emission points, thus reducing the high cost of housekeeping.

In addition, the feed industry must adhere to Current Good Manufacturing Practices (CGMP's), promulgated by the Food & Drug Administration (FDA) for the prevention of unsafe carryover and contamination of feedstuffs. Strict written housekeeping programs

must be in place and enforced. AFIA believes this flow diagram should be updated, reflecting that all points may not be emission sources, depending upon construction.

In addition, many of the emission points listed are within the structure of the facility. It is untrue that all emissions find their way to the outside of the building. If this was the case, there would be no need for ongoing housekeeping programs and a need to sweep or vacuum the interior of mills. As the permitting program of the CAA unfolds, the permit writer's understanding of which emission sources actually affect the environment is critical. For this reason, AFIA recommends a footnote should be added stating some emission points may be located inside structures and emissions internally recycled.

On page 2-55, second paragraph, the pellet cooling process is described as using "air at room temperature." This wording should be changed to read "ambient air." The high volume of air drawn through pellet coolers, in many applications, comes from the outside. Air passes into the building, is slightly warmed or cooled depending upon the season, but generally remains at outdoor temperatures. "Ambient air" is the term commonly used in the feed industry.

The last paragraph on page 2-55 states pneumatic conveying may be used for sending pelleted product to storage bins. Pneumatic conveying is generally avoided due to breakage of the product.

Typically, elevator legs are used for this material handling process, and this should be stated. Very little, if any, emissions are released from a well-maintained elevator leg, including those points of loading and discharge.

2.3.2.6 ANIMAL FEED MILLS

The first paragraph fails to mention differences in emissions between truck dumps and the "choke flow" associated with hopper bottom trucks and rail cars. AFIA agrees the receiving operation may be the most uncontrolled emission point, but methods of receiving, along with the types of materials received can present fewer emissions as compared to typical country elevator receiving operations. AFIA recommends the benefits of receiving hopper bottoms should be stated.

4.1 REVIEW OF SPECIFIC DATA SETS

4.1.1 REFERENCE 4 (1987)

AFIA visited with the company which supplied the data in this reference. That firm expressed concerns regarding the Emission Factor Quality Rating applied to these values. The company believes the testing was performed using approved test methods, and the data obtained should carry a rating of "A" or "B," as opposed to "C" or "D." Secondly, some very good test data obtained in 1987 on triple cyclones was not incorporated in this latest draft. The average results from those three tests (Mill 5) reflected average emissions of 0.16 lb/T. AFIA urges a review and inclusion of those results in the next draft. Copies of this test are attached.

4.1.18 REFERENCE 38 (1972)

This information is the same data reported in table 4-2 from Reference 4. In Reference 4, the data carries a "D" rating, but in this reference, an "A." This obvious inconsistency needs to be clarified.

4.1.21 REFERENCE 41 (1972)

AFIA questions the validity of the test data stated for the pan cooler cyclone outlet, i.e. 6.1 lb/T. AFIA's experience reveals this number is either miscalculated or not representative. After further review of the calculations in Appendix V, page V-9, it is clear that the addition of the three emissions were not divided by 3. This would recalculate to 15.42 lb/hr. Then, by dividing by the 7.6 tons, the result is a correct emission of 2.03 lb/T, not the reported 6.1 lb/T. This value is still too high and not acceptable. In reviewing the test data as listed on Table 4-15 on page 4-35, cyclone emissions routinely fall well below 1.0 lb/T. After additional review of the pan cooler test, it appears these pellets were dusted. AFIA assumes this means limestone was added to urea beef pellets prior to cooling to aid flowability. Adding limestone for this purpose is common, but is not ordinarily added prior to cooling. Typically such an application is done after cooling, but prior to bin entry. If applied prior to cooling, as was done in this test, much of the limestone would be exhausted. Looking at the technician's comments, visible emissions were reported at 15-50%. This confirms a non-typical limestone

application was tested. There is likely not one mill in the country operating under these conditions. Opacity readings alone would jeopardize the mill's compliance with state and local air quality regulations. AFIA feels the test and the result is so unrepresentative, and skews the average. This value should not be included. The test does not represent typical pelleting operations. AFIA urges EPA to discard the 6.1 lb/T test result, and disregard that test entirely as not representative of typical pelleting operations.

4.3.2 PARTICLE SIZE DATA ANALYSIS

As mentioned earlier, Table 4-15 on page 4-35 summarizes the recognized test data for pellet coolers controlled with cyclones. Since the 6.1 lb/T value is flawed, it does not represent typical pelleting operations. Averaging reveals 0.99 lb/T, as listed in the main body of the text in Table 6.9.1-6 on page 6.9.1-33. AFIA's industry experience shows this value is too high. If the one "outlier" (6.1 lb/T) was not incorporated, the average of the data listed in Table 4-15 would be 0.48 lb/T. AFIA still contends this value is too high.

In reconsidering the data listed on Table 4-15, page 4-35, the 6.1 lb/T value must be discarded. AFIA recommends EPA include the three emission factors from Purina's Mill 5 test, which are 0.12, 0.20, and 0.17 lb/T. The new average calculates to 0.409 lb/T.

This all points to a more realistic emission factor for pellet cooler cyclones more closely resembling the 1988 AP-42 factor of 0.4 lb/T, rather than the new proposed value of 0.99 lb/T. AFIA strongly encourages EPA to consider discarding the 6.1 lb/T value and test, and incorporating Purina's Mill 5 test data supplied in 1987.

6.9.1 GRAIN ELEVATORS AND PROCESSING PLANTS

6.9.1.2 Emissions and Controls

The comments previously expressed in 2.2.2.6 apply equally to this section regarding Figure 6.9.1-7 -- Typical feed milling process flow diagram.

The Particulate Emission Factors For Grain Processing Facilities, Tables 6.9.1-5 and 6.9.1-6, references grain elevator emission factors for animal feed mill receiving operations. As stated in 2.1.2, 2.2.2.6, and 2.3.2.6, AFIA believes the method of receiving, i.e., truck dump versus "choke flow" on hopper bottom trucks and rail cars, greatly affects the level of emissions. Rather than these two tables referencing another table, AFIA recommends two categories and values of emission factors added under the heading of Grain Receiving: Truck Dumps and Hopper Bottoms, with respective emission factors. AFIA reviewed the data reported in Table 4-13, page 4-32, and questions why the "B" rating data from Reference 24 was not included? AFIA recommends it be included. If recalculated, this data reveals an average emission factor for country elevator truck dumps of 2.32 lb/T, as opposed to the 3.4

lb/T reported on Table 6.9.1-4 on page 6.9.1-25. AFIA's experience suggests 2.32 lb/T is more representative. AFIA recommends the emission factor for hopper bottoms should be 0.59 lb/T as reported on Table 6.9.1-4, page 6.9.1-25, under inland terminal elevators.

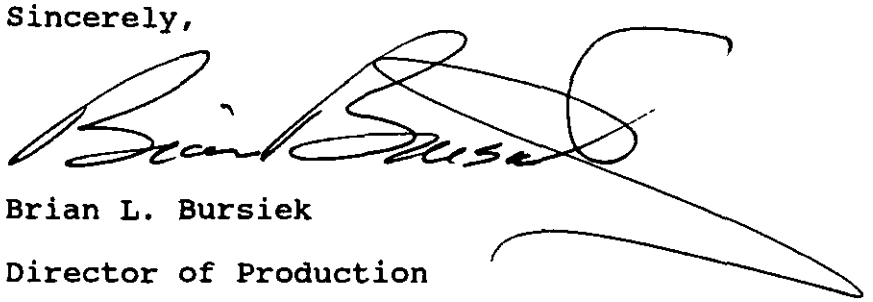
As mentioned earlier, the emission factor for pellet coolers with cyclones should approximate the 1988 value of 0.4 lb/T, not the current proposed value of 0.99 lb/T.

Tables 6.9.1-5 and 6.9.1-6 are incomplete with regards to emission factors for PM-10. AFIA understands data is not available. However, some states are providing tables of PM-10 emission factors with emission surveys. These were mailed out this summer in preparation for the permitting rule. AFIA wishes to know where these numbers were obtained. If proven to be valid, AFIA believes the data should be included in AP-42. The CAA regulates PM-10 emissions. AFIA questions how enforcement can be accomplished if PM-10 emission factors do not exist. AFIA would appreciate the opportunity to comment if such values are obtained and incorporated into AP-42.

These comments on draft section 6.9.1, Grain Elevators and Grain Processing Plants, support EPA's efforts to continue to improve the AP-42 document. These emission factors, if properly developed, will be beneficial to state officials in implementing the requirements of the CAA permit rule. Many state inspectors, and members from industry, may not understand different emission levels

relative to different applications. AFIA believes its comments will aid the development of the AP-42 document, and help the users understand and comply. AFIA wants to further improve the Emission Factor Ratings by supplying EPA with more contemporary data as it becomes available. If you have any questions relative to any of AFIA's comments, feel free to contact me.

Sincerely,



Brian L. Bursiek
Director of Production

TABLE I

MILL 5

SUMMARY OF TEST RESULTS

Test Run	Test Time	Grain Loading gr/DSCF	Process Weight Lbs/Hr	Allowable Emissions Lbs/Hr	Actual Emissions Lbs/Hr	lb/T
1	10:17 to 11:23	0.0067	18,448	14.5	1.1	0.12
2	12:16 to 13:21	0.0092	16,000	13.0	1.6	0.2
3	13:40 to 14:43	0.0067	13,093	11.5	1.1	0.17

On the basis of these test results, the actual emissions meets the .25 gr/DSCF and the pounds per hour allowable emissions set by the . Health Department.

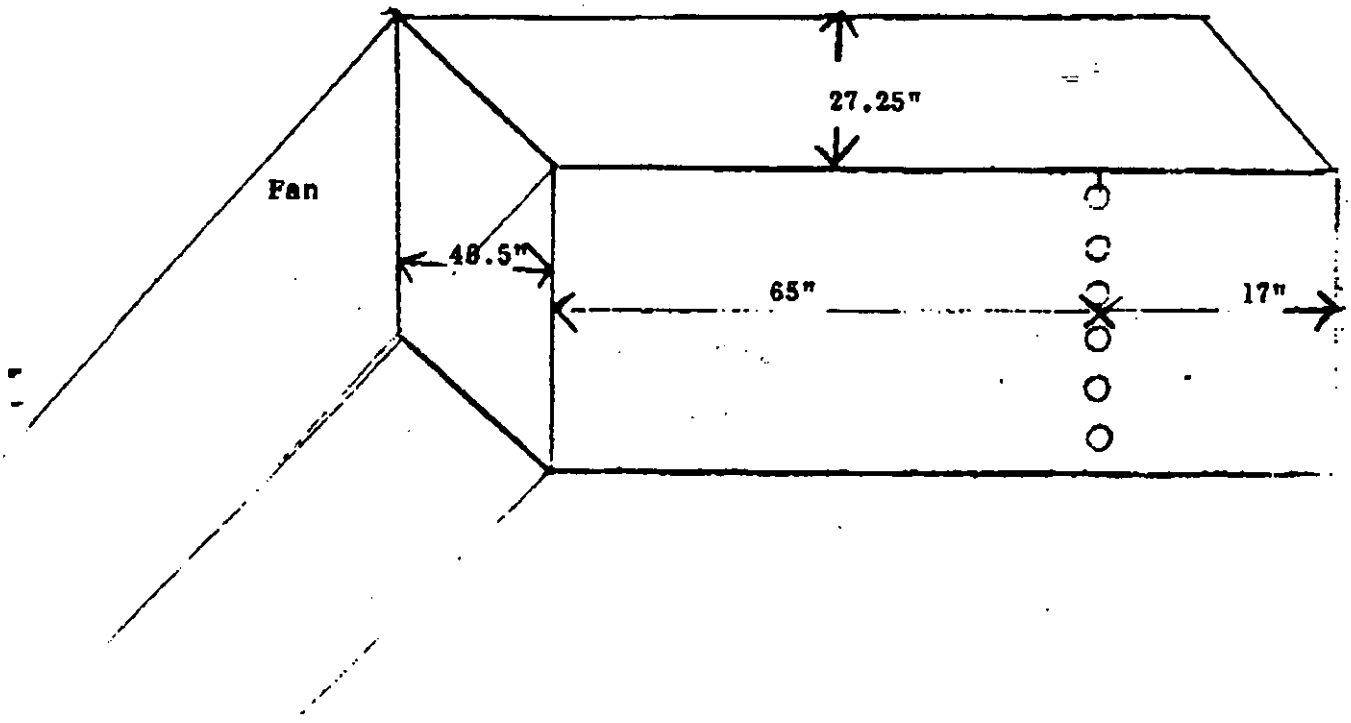
III. TEST PROCEDURES

A. Method Used: Method 5 source sampling was conducted in accordance with requirements of the U.S. Environmental Protection Agency as set forth in 42 FR 37963, July 25, 1977, as amended.

B. Problems Encountered: No problems were encountered that affected testing.

C. Sampling Site: The emissions test was conducted after a series of three cyclones on a rectangular duct measuring 40.5" x 27.25" with an equivalent diameter of 32.5". Six sample ports were placed 65" down (2.0 diameters upstream) from a bend in the duct and 17" up (0.5 diameters downstream) from the exit. Thirty points were sampled, five through each port for two minutes each for a total testing time of sixty minutes per test run.

Points on a Diameter	Probe Marks
1	2.7"
2	8.2"
3	13.6"
4	19.1"
5	24.5"



V. EQUIPMENT USED

Equipment used on conducting the particulate emissions test was:

A. The Lear Siegler PM-100 stack sampler with appropriate auxillary equipment and glassware. The train was set up according to the schematic on the nex page.

B. An Airguide Instruments Model 211-B (uncorrected) aneroid barometer was used to check the barometric pressure.

C. Weston dial thermometers are used to check meter temperatures. An Analogic Model 2572 Digital Thermocouple is used for stack temperatures.

D. A Hays 621 Analyzer was used to measure the oxygen, carbon dioxide and carbon monoxide content of the stack gases. For non-combustion sources, A Bacharach Instrument Company Fyrite is used for the gas analysis.

E. Filters are mady by Schleicher and Schuell and are type 1-HV with a porosity of .03 microns.

F. The acetone is reagent grade or ACS grade with a residue of $\leq$ .001.

NAME: PURINA MILLS

LOCATION: Mill 5 _ | date 6/04/87 6/04/87 6/04/8

	SUMMARY OF TEST DATA		RUN # 1	RUN # 2	RUN #
	SAMPLING TRAIN DATA	start	10:17	12:16	13:41
		finish	11:23	13:21	14:43
1	Sampling time, minutes	θ	60	60	60
2	Sampling nozzle diameter, in.	Dn	.210	.210	.210
3	Sampling nozzle cross-sectional area, ft^2	An	.000241	.000241	.000241
4	Isokinetic variation	I	96	97	98
5	Sample gas volume - meter conditions, cf.	Vm	37.66	39.45	38.74
6	Average meter temperature, °R	Tm	565	572	573
7	Average orifice pressure drop, in.H_2O	ΔH	1.23	1.32	1.26
8	Total particulate collected mg.	Mn	15.6	22.1	15.8
	VELOCITY TRAVERSE DATA				
9	Stack area, ft^2	A	7.7	7.7	7.7
10	Absolute stack gas pressure, in. Hg.	Ps	30.20	30.20	30.20
11	Barometric pressure, in. Hg.	Pbar	30.20	30.20	30.20
12	Average absolute stack temperature, °R	Ts	567	572	576
13	Average $\sqrt{\text{velocity head}}$, (Cp= .79)	$\sqrt{\Delta P}$	.85	.88	.86
14	Average stack gas velocity ft. / sec.	Vs	47	49	48
	STACK MOISTURE CONTENT				
15	Total water collected by train, ml.	Vlc	16.0	31.0	30.0
16	Moisture in stack gas, %	Bws	2.2	3.9	3.7
	EMISSIONS DATA:				
17	Stack gas flow rate, dscf/hr. (000's)	Qsd	1,192	1,211	1,180
18	Total particulate concentration, gr/dscf	Cs	.0067	.0092	.0067
19	Total particulate concentration, lbs/hr	E	1.1	1.6	1.1
20	Total particulate concentration, lbs/mbtu	E'	.0000	.0000	.0000
	ORSAT DATA				
21	Percent CO2 by volume	CO2	1.0	1.0	1.0
22	Percent O2 by volume	O2	9.0	9.0	9.0
23	Percent CO by volume	CO	.0	.0	.0
24	Percent N2 by volume	N2	90.0	90.0	90.0

Buzzycalc