FRITZ ENTERPRISES INC.

November 17, 2015

U. Sam Amer
Senior Environmental Engineer
Michigan Department of Environmental Quality
Air Quality Division
3058 West Grand Blvd.
Suite 2-300
Detroit, MI 48282

Subject: Fritz Enterprises
Taylor, Michigan
Violation Notice (dated October 29, 2015)

Dear Mr. Amer:

We have received and reviewed the above-referenced Violation Notice based on an MDEQ inspection conducted on October 23, 2015 at our Taylor plant. One a directly-related subject, we have also received your email (dated November 9, 2015) in which you question the emission calculation recently submitted for this plant. This letter addresses both the NOV and the emission calculations.

Emission Calculations

You had raised questions about the source and method for calculating air flow based on fan data. The source for the calculation formula specifically applied in the submitted spreadsheet is the Fan Engineering Handbook, published by the Buffalo Forge Company. This text is often considered the 'bible" of fan engineering and based been used for many decades. Page 12-15 of this handbook (copy attached) presents the formula (12.21) expresses the relationship among fan input power (Ps), flow rate (Q), fan total pressure (pft), air compressibility (Kp) and fan total efficiency, nt, (the ratio of fan input to output). One element of this formula is a conversion factor constant ($C_Q$). As noted in the attached text, this constant is 1.0 if using metric units but 6354 if using U.S. customary units. We used U.S. units (cfm, °F, etc.) for the calculation we sent you, hence the inclusion of the 6354 constant.

1650 W. Jefferson
Trenton, MI 48183
(734) 362-3200
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As you've seen from our previous correspondence, based solely on the above-described fan law, we had calculated a minimum flow rate of 15,507 cfm and a maximum of 59,644 cfm for the cyclone collector fan which serves the Z-Box separator. The fan outlet flow is not all discharged immediately. Same is returned back to the Z-Box; the remainder is discharged up the vertical rectangular stack as a permitted discharge.

In order to document the actual discharge flow, we conducted flow testing on November 11, 2015 at the plant. The flow calculation is as follows:

Conditions

Temperature: 59°F
Density of Air = 0.073 lb/cf
Discharge Duct Area: (A) .23" x 37" (5.9 sq.ft. area)
Velocity Pressure (VP): 1.5" w.g. (max measured at test port)
Discharge Velocity: V(ft/min) = 1096 x Square Root of (VP/0.073)
= 1096 x Square Root of (1.5/0.073)
= 1096 x 4.53
= 4968 ft/min
Flow: = V x A
= 4968 x 5.9
= 29,312 cfm

The measured volume makes sense because it falls between the calculated minimum and maximum flows. Also, it is completely consistent with the previous set of flow measurements taken during compliance testing in 1993.

NOV

The NOV asserts that there was a "failure to comply with the hourly emission rate of Particulate Matter (PM)." As pointed out in our October 27, 2015 email to you, the tested PM emission rate at Taylor averaged (3 test runs) 0.0011 gr/scf. Applying this measured rate to the recently measured flow rate results in the following calculations:

Flow Rate = 29,312 cfm
PM Conc. = 0.0011 grains/cf
PM Emission Rate = 29,312 x 0.0011
= 32.2 grains/minute
X 60 min/hr = 1934.6 grains/hour
÷ 7000 gr/lb = **0.276** lb/hr

By permit, our hourly PM emission limit is 1.16 lb/hr. We are therefore emitting less than 25% of our permitted PM limit. Therefore, contrary to the assertions of the NOV, we are fully in compliance with our hourly PM emission rate.

Conclusion

In conclusion, we trust that this letter clarifies both our compliance status and our flow/emission calculations. Please take whatever steps are necessary to clear the NOV. As always, feel free to contact me with any questions.

Sincerely,

David W. Splan
Vice President

Attachment

cc: J. Duckett (SLAI)
File