Attachment G: Checklist - Industrial Performance Standards

Industrial Performance Standards Checklist for Newly Proposed Projects

All projects within the Devens Regional Enterprise Zone (DREZ) must comply with the Devens Enterprise Commission (DEC) Industrial Performance Standards (IPS) under 974 CMR 4.00. This checklist is intended to assist Applicants in determining at the time of submittal, or ideally before submittal, if their project may or may not involve development and/or activities that may impact sound, vibration, air quality, or lighting within the DREZ.

Site layout, building(s) design/orientation, traffic patterns, location of outdoor equipment and numerous other project components can impact sound, vibration, air quality, and lighting within the DREZ. By identifying any potential IPS concerns early on in the review process, Applicants can design their projects to ensure compliance with the IPS at all times and avoid potential future violations of the IPS and costly mitigation after the fact.

Please note, if a project requires an air permit from the Massachusetts Department of Environmental Protection (DEP), the Applicant will need to initiate permitting through the DEP office as well. Even if a project requires a DEP air permit, the proponent still must demonstrate compliance with the DEC IPS.

Please circle the correct answer to each question in this checklist. Please note that by circling "NO", the Applicant is not relieved of demonstrating compliance with the IPS requirements. If "NO" is circled and a potential concern is identified during the review process, it could temporarily suspend the approval process timeline until the concern is adequately addressed. If "YES" is answered, please explain and provide any supporting studies, modelling files, or information to aid the DEC in their evaluation of the project.

Project Name Commonwealth Fusion Systems Building 4 - FLiBe Loop

Does the proposed project and associated activities involve any potential increases in sound, vibration, air quality, odor, dust, lighting and/or electromagnetic interference that are covered under the DEC Industrial Performance Standards?

YES	NO

If you answered yes, will the Applicant demonstrate compliance directly or will the project proponent employ an expert to demonstrate compliance? Please provide pertinent contact information of the responsible official:

Noise and Vibration - Cavanaugh Tocci - Contact: Bradley Dunkin 814.232.0064

Air Quality - Commonwealth Fusion Systems - Contact: Chris Scholl

Lighting and Illumination - Jacobs - Contact: John Jackson 617.250.4954

EMI - Commonwealth Fusion Systems - Contact: Darby Dunn or Kyle Metzroth

Industrial Performance Standards Checklist for Newly Proposed Projects cont…

Noise

Does the proposed project have the ability to increase sound? YES NO

1. Will the increase in sound plus background sound exceed 974 CMR 4.05 (3)a? YES NO

2. Will the total sound plus background sound exceed 974 CMR 4.05 (3)b? YES NO

3. Will the increase in sound create pure tones that will exceed 974 CMR 4.05 (3)c and/or 974 CMR 4.05 (3)d7? See Note 1 YES NO

4. Will the increase in sound create impulsive sounds that will exceed 974 CMR 4.05 (3)d1-6 and/or 974 CMR 4.05 (3)d8? YES NO

5. Are there procedures and controls proposed to reduce sound during earth removal per 974 CMR 4.07(10)? YES NO

Checklist Options to Demonstrate Sound Compliance

6. Have all of your potential sound sources been identified? YES NO

7. Will spreadsheet calculations of the potential increase in sound be provided? YES NO

8. Will sound modeling of the proposed project be provided? YES NO

9. Will the facility submit a protocol describing the potential sound monitoring, metrics, and modeling as required? See Note 2 YES NO

10. Does the project propose to collect background sound data (typically 7-days worth of valid data is sufficient)? YES NO

11. If the facility intends to collect background sound data will it include other qualifying weather data such as wind speed, wind direction, sky conditions, etc.? YES NO

12. Is mitigation to reduce the overall sound profile proposed? YES NO

13. Is sound mitigation to be assumed when calculations or modeling is performed? (modelling files are required to be submitted to the DEC) YES NO

14. Is compliance monitoring proposed to demonstrate that the project meets the estimated increases in sound? YES NO

15. Have increases in sound with respect to traffic been considered? YES NO

Industrial Performance Standards Checklist for Newly Proposed Projects cont…

Vibration

Does the proposed project have the ability to increase vibration?	**YES**	**NO**
16. Will the increase in vibration exceed 974 CMR 4.05 (4)a??	**YES**	**NO**
Checklist Options to Demonstrate Vibration Compliance		
17. Have all of the potential vibration sources been identified?	**YES**	**NO**
18. Will spreadsheet calculations of the potential increase in vibration be provided?	**YES**	**NO**
19. Will the proponent provide vibration modeling of the proposed project?	**YES**	**NO**
20. Does the project propose to collect background vibration data?	**YES**	**NO**
21. Is mitigation proposed to reduce the overall vibration profile?	**YES**	**NO**
22. Is vibration mitigation to be assumed when the calculations or modeling performed?	**YES**	**NO**
23. Is compliance monitoring proposed to demonstrate that the project meets the estimated increases in vibration as proposed?	**YES**	**NO**

Note 1: Third-octave sound data for proposed facility equipment is not available for assessment of a pure-tone condition. However, modeled sound levels at receptors are significantly below the measured background sound level. Therefore we would anticipate that any tonal sound at the source, when combined with the background sound spectrum at receptor locations, would not result in a pure-tone condition at these receptors.

Note 2: This project uses sound monitoring data previously collected during sound analysis of CFS-1 and CFS-2.

Industrial Performance Standards Checklist for Newly Proposed Projects cont…

Air Quality

Does the proposed project have the ability to create air, visible, and/or odor emissions? YES NO

24. Will the proposed project meet the air quality standards in 974 CMR 4.02(3) YES NO

25. Are there procedures and controls proposed to minimize impacts during earth removal per 974 CMR 4.07(7)? YES NO

26. Will the proposed project require a MassDEP air quality permit per 974 CMR 4.02 (1) YES NO

If the project will require an air permit, then the proponent should set up a meeting with the regional MassDEP office to determine air permitting requirements, and answer the following:

27. Will the proposed project submit a Limited Plan Approval application? YES NO

28. Will the proposed project submit a Non-Major Comprehensive Plan Approval application? YES NO

29. Will the proposed project submit a Major Comprehensive Plan Approval application? YES NO

30. Will the proposed project be a Title V source? YES NO

31. Will the proposed project be a PSD source? YES NO

Checklist Options to Demonstrate Air Quality Compliance

32. Have you identified all of your potential air, visible and/or odor sources? YES NO

33. Will there be any visible emissions? YES NO

34. Will there be any dust emissions? YES NO

35. Will there be any odor emissions? YES NO

36. Will there be any potential increases in air, odor or dust emissions within the DREZ that will impact any internal or external receptors? YES NO

37. Will the project proponent provide spreadsheet calculations of the potential increase in air and/or odor emissions within the DREZ to demonstrate how the increase will not impact any internal or external receptors? YES NO

Industrial Performance Standards Checklist for Newly Proposed Projects cont…

Checklist Options to Demonstrate Air Quality Compliance (cont.)

38. Will the project proponent provide air and/or odor modeling of the proposed project within the DEC or into the neighborhood surrounding the DEC?? — YES NO

39. Is mitigation proposed to reduce the overall air and/or odor profile? — YES NO

40. Is air pollution and/or odor control to be assumed when the calculations or modeling is performed? — YES NO

41. Is compliance monitoring proposed to demonstrate that the project meets the estimated increases in air and/or odor as proposed? — YES NO

Lighting/Illumination

Does the proposed project have the ability to create additional Illumination? — YES NO

42. Will lighting meet the illumination standards set forth in 974 CMR 4.04(3)? — YES NO

43. Have all of the potential light sources been identified? — YES NO

44. Will spreadsheet calculations of the potential increase in light and how it will not affect the Observatory outlined in 974 CMR 4.04(1) or any external or internal receptors be provided? — YES NO

45. Is mitigation proposed to reduce the overall light profile? — YES NO

Electromagnetic Interference

Does the proposed project have the ability to create electromagnetic interference? — YES NO

46. Have you identified all your potential electromagnetic sources? — YES NO

47. Are you proposing to provide spreadsheet calculations of the potential increase in electromagnetic interference and how it will not affect any internal or external receptors as per 974 CMR 4.03(3)? — YES NO

48. Are you proposing any mitigation to reduce your overall electromagnetic profile? — YES NO

49. Will your project comply with all the electromagnetic requirements under 974 CMR 4.03? — YES NO

Attachment H: Noise Study

Commonwealth Fusion Systems
Building 4 (CFS-4)
Hospital Road, Devens, MA

MassDEP Form BWP AQ Sound
Sound Level Entries

September 22, 2025

Project Overview

Cavanaugh Tocci has conducted a study of environmental sound produced by mechanical equipment serving the CFS-4 building currently being designed for the Commonwealth Fusion Systems (CFS) Campus in Devens, MA. This study reviews applicable limits on facility sound and develops sound control concepts as may be required for compliance with the MassDEP Noise Policy and the Devens Enterprise Commission (DEC) Industrial Performance Standards (IPS) noise limits.

The CFS-4 building is part of a four-building campus located at 117 Hospital Road in Devens, MA. Construction of CFS-1 is substantially complete and the building is occupied, CFS-2 is under construction with portions in use, and CFS-3 and CFS-4 are in design. Figure 1 shows the location of CFS-4 in relation to the CFS campus and surrounding area.

The analysis discussed in this report and the MassDEP BWP AQ Sound are for CFS-4 only; other campus buildings are included in the analysis only as potential shielding structures, without analyzing their sound contributions.

Nighttime Background Sound Monitoring

Cavanaugh Tocci has been requested to prepare a Massachusetts Department of Environmental Protection Form BWP AQ Sound for the CFS-4 building. Hourly sound monitoring at Locations L1-L4 shown in Figure 1 was conducted in 2022, prior to completion of any of the four CFS campus buildings. Among the data collected continuously over the seven-day period are the hourly 90th percentile Fast response A-weighted sound pressure levels ($LAF_{90,1\text{-}hr}$) defined as the hour background sound level.

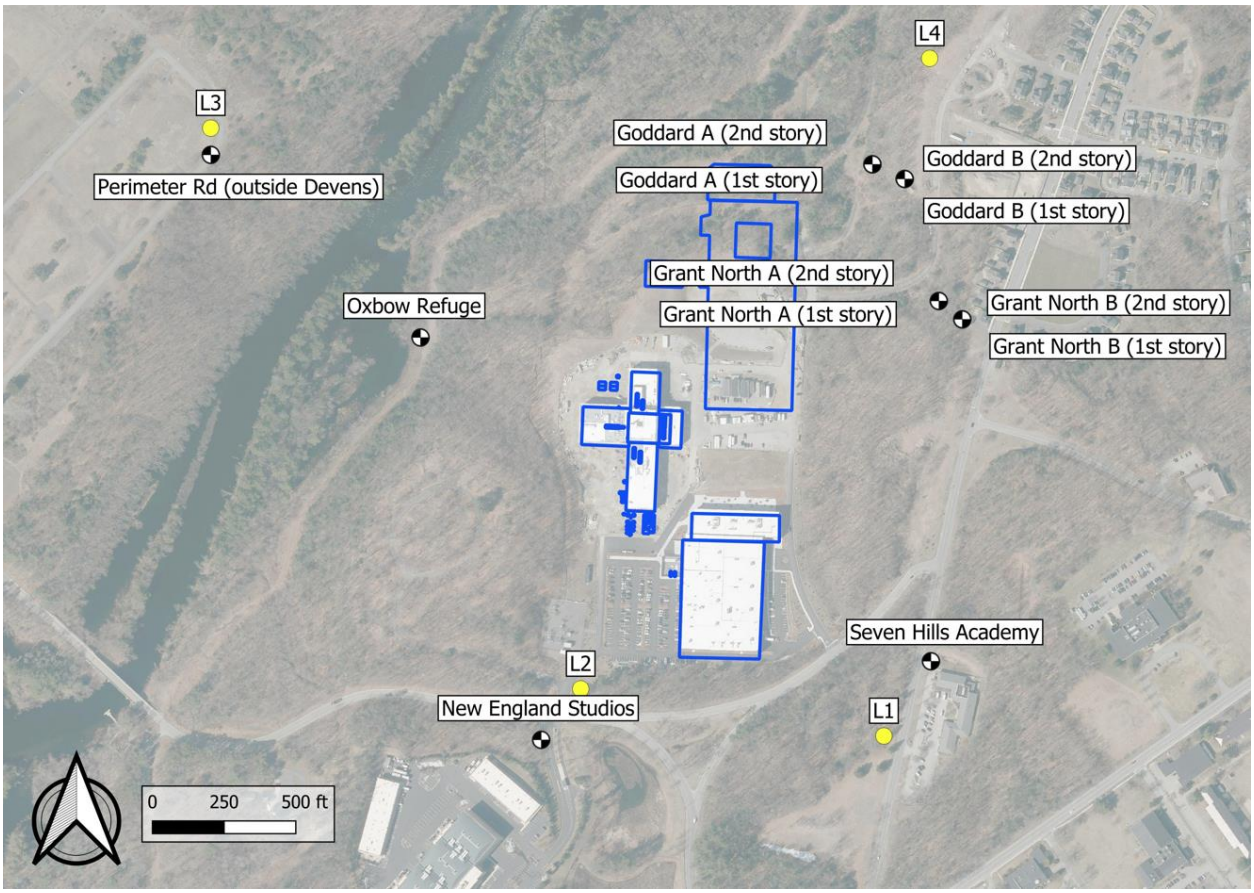


Figure 1. CFS-4 sound monitoring locations and nearest receptor study locations
Commonwealth Fusion Systems, Devens, Massachusetts

The hourly data collected over the seven days monitored are included in Appendix A of this report. For each location monitored, the data is arranged as two sub-tables in Appendix Tables A-1 to A-4. The upper sub-table of each of the four sets reports the $LAF_{90,1\text{-}hr}$ as measured each hour between midnight August 1 to midnight August 7, 2022. The lower subtable reports the $LAF_{90,1\text{-}hr}$ spectra truncated above the 1000 Hz octave band in accordance with ANSI S12.100[1] to eliminate insect sound that at times raised the background sound levels by 15-25 dBA. By removing insect sound from the measured background sound level spectra, MassDEP noise limits more appropriately represent quieter times of year. Lowest measure $LAF_{90,1\text{-}hr}$ after truncation are listed in Table 1 below.

[1] American National Standard S12.100-2014 Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas

Loc.	Hour, Day, Date of Lowest $LAF_{90,1\text{-}hr}$	31	63	125	250	500	1000	2000	4000	8000	A-wt Trunc
L1	5 PM, Friday, August 5, 2022	50	49	42	37	36	35				38
L2	7 AM, Sunday, August 7, 2022	46	45	51*	39	35	32				39
L3	8 AM, Saturday, August 6, 2022	43	45	38	31	27	23				29
L4	8 AM, Saturday, August 6, 2022	44	42	38	33	29	25				31

*The 51 dB tone in the 125 Hz band at L2 is produced by NE Studios rooftop mechanical equipment.

Table 1. ANSI S12.100 truncated lowest measured nighttime (10 PM-7 AM) $LAF_{90,1\text{-}hr}$ sound level spectra Commonwealth Fusion Systems, Devens, MA

The $LAF_{90,1\text{-}hr}$ spectra of Table 1 have been assigned to the nearest receptors identified in Figure 1. For each of the twelve receptor study locations, Appendix B contains the background sound level spectra, sound levels produced by the two cooler options, and the sum of each cooler option and the nighttime background. The sum of background and source sound are labeled as "night background plus facility." To the right of each table, the increase in nighttime background for each cooler option and whether a tone results is indicated.

Note that the nighttime background measured at L2, close to New England Studios, has a tone produced by rooftop equipment at New England Studios. The tone is not related to Commonwealth Fusion Systems, and is evident in both "night background" and in the "night background plus facility" spectra for both cooling options. As reported in the Appendix B tables, increases in background resulting from CFS-4 operation are well below 10 dB, less than 1 dB at nearest residences, and less than 6 dB at night in the Oxbow Refuge when it is seldom visited. The low increases result from compliance with the more demanding Devens Enterprise Commission Industrial Performance Standards limits. The CFS-4 acoustical design, to meet the DEC limits, will implement Best Available Control Technology (BACT).

MassDEP Form BWP AQ Sound

As the MassDEP Form BWP AQ Sound has only four lines for each entry category, the following provides the same required information for 12 receptor locations. The first eight locations are residential; the remaining are commercial and parklands. The following are applicable entry areas of the BWP AQ Sound and are provided in lieu of entries on the form itself.

1. Lowest ambient sound pressure levels during operating hours of the equipment.

a. At property line:

Night Backgrounds	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Goddard A (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Goddard A (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Goddard B (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Goddard B (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North A (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North A (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North B (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North B (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
New England Studios (L2)	43	43	51	35	29	27	0	0	0	37	Yes
Oxbow Refuge (L3)	42	42	35	28	26	22	0	0	0	27	No
Perimeter Rd (outside Devens) (L	42	42	35	28	26	22	0	0	0	27	No
Seven Hills Academy (L1)	46	43	39	33	29	26	0	0	0	31	No

Note: The tone in the 125 Hz octave band is produced by rooftop equipment on the New England Studios building.

b. At the nearest inhabited building and if applicable at buildings at higher elevation:

Night Backgrounds	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Goddard A (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Goddard A (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Goddard B (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Goddard B (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North A (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North A (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North B (1st story) (L4)	40	37	34	30	26	24	0	0	0	28	No
Grant North B (2nd story) (L4)	40	37	34	30	26	24	0	0	0	28	No
New England Studios (L2)	43	43	51	35	29	27	0	0	0	37	Yes
Oxbow Refuge (L3)	42	42	35	28	26	22	0	0	0	27	No
Perimeter Rd (outside Devens) (L	42	42	35	28	26	22	0	0	0	27	No
Seven Hills Academy (L1)	46	43	39	33	29	26	0	0	0	31	No

Note: The tone in the 125 Hz octave band is produced by rooftop equipment on the New England Studios building.

2. Neighborhood sound pressure levels with source operating without sound abatement equipment.

a. At property line:

New facility. Unattenuated levels not determined.

b. At the nearest inhabited building and if applicable at buildings at higher elevation:

New facility. Unattenuated levels not determined.

3. Expected neighborhood sound pressure levels after installation of sound abatement equipment.

a. At property line (for both cooler options)**:**

Night Backgrounds plus Facility Quiet Fan Option	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Goddard A (1st story)	40	37	34	30	26	24	5	5	5	28	No
Goddard B (1st story)	40	37	34	30	26	24	6	5	5	28	No
Grant North A (1st story)	40	38	35	31	27	24	11	6	5	29	No
Grant North B (1st story)	40	38	35	31	26	24	11	6	5	29	No
New England Studios	43	43	51	35	30	27	12	5	5	37	Yes
Oxbow Refuge	42	42	36	29	27	23	15	10	5	29	No
Perimeter Rd (outside Devens)	42	42	35	28	26	22	7	5	5	28	No
Seven Hills Academy	46	43	40	33	30	26	15	7	5	32	No

Note: The tone in the 125 Hz octave band is produced by rooftop equipment on the New England Studios building.

Night Backgrounds plus Facility Gound Mounted Option	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Goddard A (1st story)	40	38	34	30	26	24	3	3	3	28	No
Goddard B (1st story)	40	38	35	31	26	24	4	3	3	28	No
Grant North A (1st story)	40	39	35	31	26	24	6	3	3	29	No
Grant North B (1st story)	40	39	35	31	26	24	6	3	3	29	No
New England Studios	43	43	51	35	30	27	9	3	3	37	Yes
Oxbow Refuge	42	43	38	35	31	27	19	10	3	33	No
Perimeter Rd (outside Devens)	42	42	36	31	27	23	11	3	3	29	No
Seven Hills Academy	46	43	40	33	30	27	14	3	3	32	No

Note: The tone in the 125 Hz octave band is produced by rooftop equipment on the New England Studios building.

b. At nearest inhabited building and if applicable at buildings at higher elevations (for both cooler options)**:**

Night Backgrounds plus Facility Quiet Fan Option	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Goddard A (2nd story)	40	37	34	30	26	24	5	5	5	28	No
Goddard B (2nd story)	40	37	34	30	26	24	7	5	5	28	No
Grant North A (2nd story)	40	38	35	31	27	24	12	6	5	29	No
Grant North B (2nd story)	40	38	35	31	27	24	12	6	5	29	No
New England Studios	43	43	51	35	30	27	12	5	5	37	Yes
Oxbow Refuge	42	42	36	29	27	23	15	10	5	29	No
Perimeter Rd (outside Devens)	42	42	35	28	26	22	7	5	5	28	No
Seven Hills Academy	46	43	40	33	30	26	15	7	5	32	No

Note: The tone in the 125 Hz octave band is produced by rooftop equipment on the New England Studios building.

Night Backgrounds plus Facility Gound Mounted Option	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Goddard A (2nd story)	40	38	35	30	26	24	3	3	3	28	No
Goddard B (2nd story)	40	38	35	31	26	24	4	3	3	28	No
Grant North A (2nd story)	40	39	36	31	26	24	7	3	3	29	No
Grant North B (2nd story)	40	39	35	31	26	24	7	3	3	29	No
New England Studios	43	43	51	35	30	27	9	3	3	37	Yes
Oxbow Refuge	42	43	38	35	31	27	19	10	3	33	No
Perimeter Rd (outside Devens)	42	42	36	31	27	23	11	3	3	29	No
Seven Hills Academy	46	43	40	33	30	27	14	3	3	32	No

Note: The tone in the 125 Hz octave band is produced by rooftop equipment on the New England Studios building.

Conclusions

Sound produced by both of two options studied for coolers proposed for Commonwealth Fusion Systems Building 4 will produce increases in nighttime background sound levels at the nearest inhabited buildings by not more than 1 dB at all existing residences and by less than 6 dB at other nearby occupancies. Sound attenuation methods and equipment are the best available control technology, which is needed to meet the more stringent standards of the Devens Enterprise Commission Industrial Performance Standards.

* * *

Please let us know if further information is required. Thank you.

Appendix A

Sound Monitoring Data
Locations L1-L4, Devens, MA
Monday, August 1 to Sunday, August 5, 2022

AS MEASURED							
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	58	58	62	58	58	59	60
1:00 AM	56	56	58	57	58	58	59
2:00 AM	55	57	57	59	58	61	58
3:00 AM	59	56	61	58	58	61	59
4:00 AM	60	61	61	61	63	61	61
5:00 AM	65	65	65	65	66	64	63
6:00 AM	65	66	66	64	66	62	62
7:00 AM	65	65	67	66	65	64	63
8:00 AM	66	66	67	65	66	63	61.80
9:00 AM	64	66	66	64	65	63	63
10:00 AM	65	66	64	64	64	64	63
11:00 AM	65	64	64	65	65	64	63
12:00 PM	64	64	64	66	65	64	64
1:00 PM	66	64	63	63	63	64	61.80
2:00 PM	64	65	66	64	64	63	63
3:00 PM	66	66	65	64	68	64	63
4:00 PM	64	64	65	64	65	64	63
5:00 PM	65	64	66	64	65	64	63
6:00 PM	64	65	64	62	64	63	62
7:00 PM	63	62	61	62	62	62	63
8:00 PM	62	61	62	61	61	62	61
9:00 PM	63	62	64	61	61	62	62
10:00 PM	58	61	61	60	61	62	59
11:00 PM	61	60	61	61	61	61	60
		111	115		179		
AS MEASURED--1250 Hz and Higher 1/3 octave bands truncated							
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	36	36	31	37	37	37	37
1:00 AM	35	36	31.0	37	37	36	36
2:00 AM	35	36	31	37	35	35	36
3:00 AM	36	36	33	37	34	35	36
4:00 AM	38	37	35	37	35	34	36
5:00 AM	44	40	39	40	39	36	37
6:00 AM	46	43	42	44	41	39	39
7:00 AM	46	44	42	45	42	39	39
8:00 AM	48	43	42	43	42	38	38
9:00 AM	46	41	42	42	42	38	38
10:00 AM	46	40	41	42	40	38	40
11:00 AM	46	42	43	43	40	40	41
12:00 PM	45	43	42	42	40	40	42
1:00 PM	46	42	41	42	40	40	42
2:00 PM	45	43	42	41	41	39	43
3:00 PM	46	43	43	42	42	41	42
4:00 PM	43	40	41	41	40	42	41
5:00 PM	42	39	39	39	37.7	39	39
6:00 PM	40	37	38	38	37	38	39
7:00 PM	39	36	36	38	38	38	39
8:00 PM	39	34	37	39	38	38	38
9:00 PM	39	33.2	36	36	38	38	40
10:00 PM	37	33	35	36	38	37	41
11:00 PM	37	32	38	37	37	37	40

Table A-1. Hourly 90th percentile A-weighted sound levels measured at L1 in 2022 Commonwealth Fusion Systems, Devens, MA

AS MEASURED							
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	59	52	61	56	55	58	55
1:00 AM	54	50	53	54	56	54	55
2:00 AM	50	46	53	50	54	54	56
3:00 AM	54	50	57	57	56	57	53
4:00 AM	59	58	58	70	59	57	55
5:00 AM	70	60	62	72	60	59	54
6:00 AM	69	62	63	62	63	60	59
7:00 AM	82	69	65	64	63	61	60
8:00 AM	73	72	65	66	63	61	59
9:00 AM	75	65	66	64	63	59	59
10:00 AM	70	62	65	62	66	59	59
11:00 AM	69	64	65	69	68	60	59
12:00 PM	71	68	74	61	66	60	61
1:00 PM	73	66	63	64	69	58	59
2:00 PM	71	65	66	60	65	59	62
3:00 PM	69	65	77	63	63	59	61
4:00 PM	60	65	65	60	62	60	60
5:00 PM	61	65	61	60	61	59	59
6:00 PM	60	61	60	59	59	59	59
7:00 PM	59	59	59	61	59	58	59
8:00 PM	58	59	61	60	59	59	60
9:00 PM	60	58	60	59	59	60	59
10:00 PM	57	58	57	59	58	57	57
11:00 PM	56	57	57	57	59	58	57
		111	115				
AS MEASURED--1250 Hz and Higher 1/3 octave bands truncated							217
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	38	38	37	39	39	38	38
1:00 AM	37	38	37	38	38	38	38
2:00 AM	38	38	37	38	37	38	38
3:00 AM	38	39	40	39	37	39	38
4:00 AM	39	39	44	39	38	38	38
5:00 AM	43	41	46	43	38	38	38
6:00 AM	46	44	46	44	41	39	38
7:00 AM	51	46	47	45	43	41	39
8:00 AM	49	45	48	44	43	42	40
9:00 AM	49	44	47	44	43	42	41
10:00 AM	47	43	46	44	45	42	42
11:00 AM	46	44	46	45	49	43	42
12:00 PM	47	45	45	44	43	42	43
1:00 PM	47	45	45	44	46	41	45
2:00 PM	47	44	46	43	44	41	44
3:00 PM	45	44	46	42	42	43	43
4:00 PM	42	43	45	42	42	42	42
5:00 PM	42	42	41	41	41	41	42
6:00 PM	41	40	39	40	40	40	41
7:00 PM	40	39	39	39	40	40	40
8:00 PM	40	37	40	41	39	40	40
9:00 PM	40	37	39	38	39	39	40
10:00 PM	39	37	39	38	39	39	39
11:00 PM	39	37	39	38	38	39	39

Table A-2. Hourly 90th percentile A-weighted sound levels measured at 2 in 2022 Commonwealth Fusion Systems, Devens, MA

AS MEASURED							
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	56	57	59	58	60	55	60
1:00 AM	57	51	54	49	53	52	53
2:00 AM	47	45	47	47	52	50	53
3:00 AM	52	45	57	64	56	62	51
4:00 AM	55	56	59	52	54	46	49
5:00 AM	54	60	60	58	59	63	57
6:00 AM	60	57	58	56	58	53	51
7:00 AM	56	56	60	56	57	54	55
8:00 AM	57	58	61	56	56	54	57
9:00 AM	57	52	58	58	57	58	54
10:00 AM	55	53	53	58	56	55	58
11:00 AM	58	57	52	57	56	55	59
12:00 PM	55	57	53	58	56	55	61
1:00 PM	54	60	52	57	57	56	64
2:00 PM	54	58	55	59	60	59	67
3:00 PM	55	65	57	59	61	56	63
4:00 PM	53	58	58	58	58	57	61
5:00 PM	57	59	58	56	56	50	61
6:00 PM	56	58	58	58	54	55	64
7:00 PM	53	56	56	56	57	59	57
8:00 PM	58	57	56	57	56	55	55
9:00 PM	58	57	57	57	55	59	59
10:00 PM	53	59	57	57	54	54	54
11:00 PM	50	63	52	55	53	57	56
		113					
AS MEASURED--1250 Hz and Higher 1/3 oc				159		194	
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	31	31	29	33	33	31	33
1:00 AM	31	31	30	33	32	32	32
2:00 AM	31	31	31	33	32	31	31
3:00 AM	32	31	31	33	30	31	31
4:00 AM	31	33	33	33	30	31	30
5:00 AM	37	36	35	35	34	30	31
6:00 AM	38	38	37	39	36	31	32
7:00 AM	38	38	35	40	35	29	32
8:00 AM	39	37	35	38	33	29	33
9:00 AM	38	35	33	37	32	30	35
10:00 AM	36	34	32	38	33	32	36
11:00 AM	37	35	34	39	33	34	37
12:00 PM	35	37	35	38	32	34	39
1:00 PM	35	38	34	37	33	34	40
2:00 PM	35	37	34	36	34	35	42
3:00 PM	35	39	36	36	35	36	40
4:00 PM	35	34	35	35	35	37	39
5:00 PM	35	35	33	34	32	34	39
6:00 PM	34	34	33	35	32	34	40
7:00 PM	34	33	34	34	33	35	36
8:00 PM	34	33	35	35	34	34	35
9:00 PM	34	33	34	31	34	35	35
10:00 PM	33	31	34	33	33	34	35
11:00 PM	32	27	34	33	32	34	32

Table A-3. Hourly 90th percentile A-weighted sound levels measured at L3 in 2022 Commonwealth Fusion Systems, Devens, MA

AS MEASURED							
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	54	54	62	57	57	55	54
1:00 AM	55	49	51	52	52	53	53
2:00 AM	47	48	49	50	51	51	52
3:00 AM	51	42	56	62	53	60	51
4:00 AM	53	54	55	50	51	46	50
5:00 AM	53	57	57	57	55	65	53
6:00 AM	56	54	56	56	56	50	49
7:00 AM	59	55	56	56	56	51	50
8:00 AM	63	58	62	55	53	52	53
9:00 AM	58	57	55	56	57	51	48
10:00 AM	59	62	52	62	56	53	54
11:00 AM	57	58	53	62	54	49	53
12:00 PM	55	56	53	55	53	53	57
1:00 PM	59	55	56	53	54	52	57
2:00 PM	55	53	54	57	59	53	59
3:00 PM	57	59	57	55	62	60	57
4:00 PM	51	54	57	60	57	57	55
5:00 PM	54	60	56	53	57	53	55
6:00 PM	52	56	54	58	54	52	57
7:00 PM	50	55	51	54	53	53	52
8:00 PM	56	55	55	58	55	56	56
9:00 PM	56	58	56	56	56	56	57
10:00 PM	53	59	56	56	55	55	55
11:00 PM	51	61	54	54	55	55	57
		111					
AS MEASURED--1250 Hz and Higher 1/3 octave bands truncated						194	
Time	August 1	August 2	August 3	August 4	August 5	August 6	August 7
12:00 AM	33	34	28	35	35	34	35
1:00 AM	32	33	28	35	34	33	34
2:00 AM	32	33	28	35	32	34	33
3:00 AM	34	33	31	35	32	35	33
4:00 AM	34	34	33	35	33	32	33
5:00 AM	38	38	36	38	34	32	34
6:00 AM	41	41	38	42	37	33	34
7:00 AM	42	43	37	42	37	31	34
8:00 AM	42	41	38	41	37	31	33
9:00 AM	44	39	35	40	45	31	34
10:00 AM	41	39	35	42	43	33	35
11:00 AM	41	39	37	41	36	35	37
12:00 PM	40	40	38	39	36	36	38
1:00 PM	39	40	38	39	35	36	40
2:00 PM	38	39	37	37	35	36	40
3:00 PM	37	37	38	36	36	39	40
4:00 PM	37	34	36	36	36	38	38
5:00 PM	35	34	34	36	34	37	38
6:00 PM	36	33	34	35	34	35	38
7:00 PM	36	33	34	35	35	35	37
8:00 PM	36	32	35	36	36	36	36
9:00 PM	36	31	35	32	36	36	36
10:00 PM	34	30	35	34	36	36	35
11:00 PM	34	28	37	35	35	36	35

Table A-4. Hourly 90th percentile A-weighted sound levels measured at L4 in 2022 Commonwealth Fusion Systems, Devens, MA

Appendix B

Background Increases for Two Cooler Options
Quiet Fan Option
Ground Mounted Option

Goddard A (1st story)	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option (QFO)	0	18	19	14	8	3	0	0	0	11	
Night Bkgnd + Facility	40	37	34	30	26	24	5	5	5	28	No
								Background Increase		0.3	
Ground Mounted Option (GMO)	0	28	25	18	10	5	0	0	0	14	
Night Bkgnd + Facility	40	38	34	30	26	24	3	3	3	28	No
								Background Increase		0.3	
Goddard A (2nd story)	**31**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A-wt**	**Tone**
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option	0	19	20	15	9	5	0	0	0	12	
Night Bkgnd + Facility	40	37	34	30	26	24	5	5	5	28	No
										0.3	
Ground Mounted Option (GMO)	0	29	25	19	11	6	0	0	0	15	
Night Bkgnd + Facility	40	38	35	30	26	24	3	3	3	28	No
										0.4	
Goddard B (1st story)	**31**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A-wt**	**Tone**
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option	0	20	22	18	12	8	3	0	0	15	
Night Bkgnd + Facility	40	37	34	30	26	24	6	5	5	28	No
										0.4	
Ground Mounted Option (GMO)	0	30	27	21	13	8	2	0	0	17	
Night Bkgnd + Facility	40	38	35	31	26	24	4	3	3	28	No
										0.5	
Goddard B (2nd story)	**31**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A-wt**	**Tone**
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option	0	22	23	19	13	9	4	0	0	16	
Night Bkgnd + Facility	40	37	34	30	26	24	7	5	5	28	No
										0.4	
Ground Mounted Option (GMO)	0	31	28	22	14	9	2	0	0	18	
Night Bkgnd + Facility	40	38	35	31	26	24	4	3	3	28	No
										0.5	

Table B-1. Nighttime background sound level, quiet fan and ground mounted cooler options, and nighttime background plus two facility cooler options
CFS-4, Commonwealth Fusion Systems, Devens, MA

Grant North A (1st story)	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option	0	26	27	23	19	15	11	3	0	21	
Night Bkgnd + Facility	40	38	35	31	27	24	11	6	5	29	No
										1.0	
Ground Mounted Option (GMO)	0	33	30	24	16	11	5	0	0	20	
Night Bkgnd + Facility	40	39	35	31	26	24	6	3	3	29	No
										0.8	
Grant North A (2nd story)	**31**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A-wt**	**Tone**
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option	0	26	27	24	20	16	11	4	0	22	
Night Bkgnd + Facility	40	38	35	31	27	24	12	6	5	29	No
										1.1	
Ground Mounted Option (GMO)	0	33	30	25	17	12	6	0	0	21	
Night Bkgnd + Facility	40	39	36	31	26	24	7	3	3	29	No
										0.9	
Grant North B (1st story)	**31**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A-wt**	**Tone**
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option	0	25	26	22	18	15	11	3	0	21	
Night Bkgnd + Facility	40	38	35	31	26	24	11	6	5	29	No
										0.9	
Ground Mounted Option (GMO)	0	33	30	24	16	11	5	0	0	20	
Night Bkgnd + Facility	40	39	35	31	26	24	6	3	3	29	No
										0.8	
Grant North B (2nd story)	**31**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**A-wt**	**Tone**
Night Background (L4)	40	37	34	30	26	24	0	0	0	28	No
Quiet Fan Option	0	25	26	23	19	16	11	3	0	22	
Night Bkgnd + Facility	40	38	35	31	27	24	12	6	5	29	No
										1.0	
Ground Mounted Option (GMO)	0	33	30	25	17	12	6	0	0	21	
Night Bkgnd + Facility	40	39	35	31	26	24	7	3	3	29	No
										0.9	

Table B-2. Nighttime background sound level, quiet fan and ground mounted cooler options, and nighttime background plus two facility cooler options
CFS-4, Commonwealth Fusion Systems, Devens, MA

New England Studios	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Night Background (L2)*	43	43	51	35	29	27	0	0	0	37	Yes
*Tone in background produced by receptor rooftop equipment.											
Quiet Fan Option	0	22	25	22	18	16	12	2	0	21	
Night Bkgnd + Facility	43	43	51	35	30	27	12	5	5	37	Yes
										0.3	
Ground Mounted Option (GMO)	0	32	29	24	21	17	8	0	0	23	
Night Bkgnd + Facility	43	43	51	35	30	27	9	3	3	37	Yes
										0.3	

Oxbow Refuge	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Night Background (L3)	42	42	35	28	26	22	0	0	0	27	No
Quiet Fan Option	0	27	28	23	20	18	15	8	0	23	
Night Bkgnd + Facility	42	42	36	29	27	23	15	10	5	29	No
										1.6	
Ground Mounted Option (GMO)	0	37	36	34	29	26	19	9	0	31	
Night Bkgnd + Facility	42	43	38	35	31	27	19	10	3	33	No
										5.6	

Perimeter Rd (outside Devens)	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Night Background (L3)	42	42	35	28	26	22	0	0	0	27	No
Quiet Fan Option	0	19	21	18	13	10	4	0	0	15	
Night Bkgnd + Facility	42	42	35	28	26	22	7	5	5	28	No
										0.5	
Ground Mounted Option (GMO)	0	31	30	27	21	18	10	0	0	24	
Night Bkgnd + Facility	42	42	36	31	27	23	11	3	3	29	No
										1.8	

Seven Hills Academy	31	63	125	250	500	1000	2000	4000	8000	A-wt	Tone
Night Background (L1)	46	43	39	33	29	26	0	0	0	31	No
Quiet Fan Option	0	20	23	22	20	18	14	5	0	23	
Night Bkgnd + Facility	46	43	40	33	30	26	15	7	5	32	No
										0.7	
Ground Mounted Option (GMO)	0	33	31	26	18	22	14	1	0	25	
Night Bkgnd + Facility	46	43	40	33	30	27	14	3	3	32	No
										1.1	

Table B-3. Nighttime background sound level, quiet fan and ground mounted cooler options, and nighttime background plus two facility cooler options
CFS-4, Commonwealth Fusion Systems, Devens, MA

Appendix C

Computer Modeling Source Inputs and Parameters

Modeling Technique

Modeling of facility sound was completed using Cadna/A (Datakustik GmbH, Version 2025 MR1). Cadna/A is a computer program that implements the modeling techniques of ISO 9613-1 and ISO 9613-2 to estimate source sound levels at community receptor locations. In calculating sound levels at receptor locations, the Cadna model accounts for reductions in facility sound pressure levels associated with propagation distance, shielding by intervening structures and topography, and absorption of sound by the atmosphere and porous surfaces.

Computer Model Parameters

A receptor elevation of 5 feet above grade has been used in estimating sound levels at all receptor property line locations and residential first floor locations, and 15 feet above grade for second-floor residential receptors.

As sound propagates through the environment, it may encounter boundaries which reflect or absorb some fraction of the incident sound. In our computer model, we have assumed that buildings are acoustically reflective (sound reduction of 1 dB), except where specifically noted. Shielding from topography and existing buildings was included in this analysis. To account for multiple reflectors, two orders of reflection have been included in computer modeling.

Based on our field observations (Google Earth images of the site), we have assigned a Ground Attenuation Coefficient (G) of 0.0 (full sound reflecting surface) for ground conditions on the CFS Campus that are paved and 0.5 (partial sound absorbing surface) for all areas outside the campus. Topography of the surrounding area has been obtained from the United States Geological Survey (USGS) and included in computer modeling.

Equipment Sound Data

Images of sound power data from equipment submittals are presented below.

bertrams heatec

Bertrams since 1894

TECHNICAL SPECIFICATION

Thermal data

Design heater capacity	total 63 MW in 3 x 21 MW heaters
Net plant efficiency at full load	> 90% (design 91% at 21 MW load)
FliBe fluid at heater inlet / outlet design	525°C / 625°C
FliBe fluid at heater inlet / outlet turndown	545°C / 625°C
FliBe fluid flow @ 575°C, per heater design	158.5 m^3/h (316'848 kg/h, 88 kg/s) per heater
FliBe fluid flow @ 585°C, per heater turndown	198.6 m^3/h (396'060 kg/h, 110 kg/s) per heater

Site conditions

Location and country of erection	Devens, Massachusetts, USA
Site of erection (FliBe heater package)	indoor service, protected against weather influences
Site of erection (control panel)	indoor, control room air-conditioned.
Installation altitude	< 100 m above sea level

Climatic conditions (to be confirmed)

Temperature min. / max.	15°C / +30°C (design 25°C)
Atmosphere	maritime atmosphere
Atmospheric pressure	1.015 bar
Relative humidity	76.5% @28.2°C dry bulb = 24.9 wet bulb

Wind (to be confirmed)

Direction	Variable, but mainly from southeast
ASCE 7-10 Windspeed (3 sec peak gust in mph)	Design wind speed: 138 mph (to be confirmed) Current design speed considered: 35 m/s (78 mph) Mean RI 10 year: 76 mph MRI 100 year: 109 mph

Rainfall (to be confirmed)

Max. rainfall	85 mm (app. 1 hour, 10-year storm)
Design rainfall	200 mm (app. 3hour, 50-year storm)
Annual average	1500 mm/year

Noise limitation

Combined noise sound pressure level (SPL) of equipment, machinery and their electric motors shall be limited to 85 dB (A) @ 1 m according to DIN 45635. Noise levels (SPL) shall be 85 dB (A) @ 1m from every equipment, apparatus, ducts etc. At stack outlet 68 dB(A) @ 1 m according to DIN 45635.

Cooler with low-noise fans

Moore Fans LLC Rating

Phone: (660) 376-3575 http://www.moorefans.com **Fax:(660) 376-2909**

Version 2.45

8/26/2025 20:42

		Ref No.:		**Item No.:**			
Class:	**10000**	Hub Type:	**HD**	Blade Type:	**MAG-9**		
Blade Tip:	**AM**	Adjustment:	**MAN**	Rotation:	**RH**		
Series:	**48**	Diameter:	**12** feet	Blades:	**5**		
Temperature:	**100** Deg. F	Elevation:	**500** feet	Density Ratio:	**0.928**	**0%**	
Volume:	**157993** ACFM	Air Vel.:	**1527.53** fpm	Speed:	**146.0** RPM		
Static Pressure:	**0.309** in H2O	Pv:	**0.135** in H2O	Pt:	**0.484** in H2O		
Power Reqd.:	**16.07** bhp	Motor:	**25** bhp	Total Eff:	**75.0%**		
Power @ 25 deg.	**18.56** bhp	Bld Natural Freq.:	**4.1**	Static Eff:	**47.9%**		
Blades Required:	**4.04**	API Blades Req.:	**5**	Blade Load:	**0.808**		
Tip Speed:	**5504.1** fpm			Pitch Number:	**2.62**		
Entry Correction:	**1.3**	Tip Clearance:	**0.36** inches	Angle at Root:	**22.3** deg		
Exit Correction:	**Not Applied**	Draft:	**Forced**	Orientation:	**Horizontal**		
Torque Factor:	**2**	Motor Torque:	**1799** ft. lbs	Torq/Bld:	**360** ft. lbs		
Approx. weight.:468 lbs (213 kgs)		Inertia: 5507 lb-ft2 (232.5 kg-m2)		Bore Size:		inches	
Unbalance force (G6.3): 4.6 lbs (20.5 N)		Thrust load: 284 lbs (129 kg)		Bushing Type:	**W**		
		Hub Extension: Standard		Qty required:	**1**		

Sound Levels Per Fan (Forced Draft) (Horizontal Orientation) See Note 2

Sound Power Level

dBA	HZ	63	125	250	500	1000	2000	4000	8000
82.4		**79.9**	**83.4**	**81.2**	**78.5**	**76.8**	**74.8**	**71.9**	**69.9**

Sound Pressure Level 1 meter below fan

68.3	**65.8**	**69.3**	**67.1**	**64.4**	**62.7**	**60.7**	**57.8**	**55.8**

Sound Pressure Level 1 meter radially from blade tip

63.3	**60.8**	**64.3**	**62.1**	**59.4**	**57.7**	**55.7**	**52.8**	**50.8**

Estimated Sound Pressure Level Multiple Fans (6 fans at 400 ft from periphery)

40.0	**37.5**	**41.0**	**38.8**	**36.1**	**34.4**	**32.4**	**29.5**	**27.5**

Class 10000, Series 48, 12 feet Diameter, 5 Blades
Manual Adjustment, Heavy Duty, MAG, CW Rotation Aluminum Blade Material
With AM Blade Tips,
Fan Model No. 1048/M24-W0-A/48R-AM-9-12.00-5

Note 1: Maximum blade angle to prevent fan stall is 28.0 degrees.
Available motor power may limit maximum angle to a lower value.

Note 2: Sound levels are the best estimate of the fan sound with 0 dBA additional sound included due to drive components, flow obstructions or structure reflection and reverberation.

Cooler with standard fans

Moore Fans LLC Rating

Phone: (660) 376-3575 http://www.moorefans.com **Fax:(660) 376-2909**

Version 2.45

9/3/2025 15:19

			Ref No.:			**Item No.:**	
Class:	**10000**		Hub Type:	**HD**	Blade Type:	**XC**	
Blade Tip:	**XT**		Adjustment:	**MAN**	Rotation:	**RH**	
Series:	**36**		Diameter:	**11.5** feet	Blades:	**4**	
Temperature:	**100**	Deg. F	Elevation:	**500** feet	Density Ratio:	**0.928**	0%
Volume:	**156053**	ACFM	Air Vel.:	**1573.92** fpm	Speed:	**194.0**	RPM
Static Pressure:	**0.41**	in H2O	Pv:	**0.143** in H2O	Pt:	**0.596**	in H2O
Power Reqd.:	**17.24**	bhp	Motor:	**25** bhp	Total Eff:	**85.0%**	
Power @ 25 deg.	**19.91**	bhp	Bld Natural Freq.:	**5.5** Hz	Static Eff:	**58.5%**	
Blades Required:	**3.49**		API Blades Req.:	**4**	Blade Load:	**0.873**	
Tip Speed:	**7008.9**	fpm	Deflection Angle:	**57.7** deg.	Pitch Number:	**2.70**	
Entry Correction:	**1.3**		Tip Clearance:	**0.345** inches	Angle at Root:	**14.0**	deg
Exit Correction:	**Not Applied**		Draft:	**Forced**	Orientation:	**Horizontal**	
Torque Factor:	**2**		Motor Torque:	**1354** ft. lbs	Torq/Bld:	**338**	ft. lbs
Approx. weight.:126 lbs (57 kgs)			Inertia: 1006 lb-ft2 (42.5 kg-m2)		Bore Size:		inches
Unbalance force (G6.3): 1.6 lbs (7.1 N)			Thrust load: 322 lbs (146 kg)		Bushing Type:	**U**	
One blade missing load: 919 lbs (418 kg)			Hub Extension: Standard		Qty required:	**1**	

Sound Levels Per Fan (Forced Draft) (Horizontal Orientation) See Note 2

Sound Power Level

dBA	HZ 63	125	250	500	1000	2000	4000	8000
87.3	**93.3**	**92.3**	**89.3**	**84.3**	**82.3**	**76.3**	**70.3**	**64.3**

Sound Pressure Level 1 meter below fan

73.5	**79.5**	**78.5**	**75.5**	**70.5**	**68.5**	**62.5**	**56.5**	**50.5**

Sound Pressure Level 1 meter radially from blade tip

68.4	**74.4**	**73.4**	**70.4**	**65.4**	**63.4**	**57.4**	**51.4**	**45.4**

Estimated Sound Pressure Level Multiple Fans (6 fans at 400 ft from periphery)

44.9	**50.9**	**49.9**	**46.9**	**41.9**	**39.9**	**33.9**	**27.9**	**21.9**

Class 10000, Series 36, 11.5 feet Diameter, 4 Blades
Manual Adjustment, Heavy Duty, XC Chord, CW Rotation Aluminum Blade Material
With XT Blade Tips,
Fan Model No. 1036/073-U0-A/36R-XT-8-11.50-4

Note 1: Maximum blade angle to prevent fan stall is 19.4 degrees.
Available motor power may limit maximum angle to a lower value.

Note 2: Sound levels are the best estimate of the fan sound with 0 dBA additional sound included due to drive components, flow obstructions or structure reflection and reverberation.

Appendix D

Massachusetts Department of Environmental Protection
Form BWP AQ Sound
Commonwealth Fusion Systems
Building 4 (CFS-4)
Devens, Massachusetts

CAVANAUGHTOCCI

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Air Quality

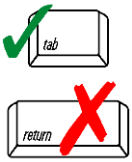
BWP AQ Sound

Submit alone and/or with Form CPA-FUEL and/or CPA-PPROCESS whenever the construction or alteration of stationary equipment (e.g. electrical generating equipment, motors, fans, process handling equipment or similar sources of sound) has the potential to cause noise, or in response to a MassDEP enforcement action citing noise as a condition of air pollution.

Transmittal Number

Facility ID (if known)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Introduction

When proposing sound suppression/mitigation measures, similar to the traditional "top-down" BACT process, the "top case" sound suppression/mitigation measures which deliver the lowest sound level increase above background are required to be implemented, unless these measures can be eliminated based upon technological or economic infeasibility. An applicant cannot "model out" of the use of the "top case" sound suppression/ mitigation measures by simply demonstrating that predicted sound levels at the property line when employing a less stringent sound suppression/mitigation strategy will result in a sound level increase of less than or equal to the 10 dBA (decibel, A –Weighted) above background sound level increase criteria contained in the MassDEP Noise Policy. A 10 dBA increase is the maximum increase allowed by MassDEP; it is not the sound level increase upon which the design of sound suppression/mitigation strategies and techniques should be based. Also, take into consideration that the city or town that the project is located in may have a noise ordinance (or similar) that may be more stringent than the criteria in the MassDEP Noise Policy

A. Sound Emission Sources & Abatement Equipment/Mitigation Measures

1. Provide a description of the source(s) of sound emissions and associated sound abatement equipment and/or mitigation measures. Also include details of sound emission mitigation measures to be taken during construction activities.

A Bertrams Heatec furnace is noted by the manufacturer to have a combined sound pressure level (SPL) of equipment, machinery and their electric motors of not more than 85 dB(A) @ 1 m according to DIN 45635. Sound levels shall be 85 dB A) @ 1m from every equipment, apparatus, ducts etc. At stack outlet 68 dB(A) @ 1 m according to DIN 45635.

Two options are being studied for the dry coolers. Option 1 is to outfit coolers with quiet fans by Moore Fans LLC or Option 2 gound mounting the coolers to take advantage of sheilding by the neighboring campus building being designed.

B. Manufacturer's Sound Emission Profiles & Sound Abatement Equipment

Please attach to this form the manufacturer's sound generation data for the equipment being proposed for installation, or the existing equipment as applicable. This data must specify the sound pressure levels for a complete 360° circumference of the equipment and at given distance from the equipment. Also attach information provided by the sound abatement manufacturer detailing the expected sound suppression to be provided by the proposed sound suppression equipment.

C. Plot Plan

Provide a plot plan and aerial photo(s) (e.g. GIS) that defines: the specific location of the proposed or existing source(s) of sound emissions; the distances from the source(s) to the property lines; the location, distances and use of all inhabited buildings (residences, commercial, industrial, etc) beyond the property lines; identify any areas of possible future construction beyond the property line; and sound monitoring locations used to assess noise impact on the surrounding community. All information provided in the sound survey shall contain sufficient data and detail to adequately assess any sound impacts to the surrounding community, including elevated receptors as applicable, not necessarily receptors immediately outside the facility's property line.

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D. Community Sound Level Criteria

Approval of the proposed new equipment or proposed corrective measures will **not** be granted if the installation:

1. Increases off-site broadband sound levels by more than 10 dBA.above "ambient" sound levels. Ambient is defined as the lowest one-hour background A-weighted sound pressure level that is exceeded 90 percent of the time measured during equipment operating hours. Ambient may also be established by other means with the consent of MassDEP.

2. Produces off-site a "pure tone" condition. "Pure tone" is defined as when any octave band center frequency sound pressure level exceeds the two adjacent frequency sound pressure levels by 3 decibels or more.

3. Creates a potential condition of air pollution as defined in 310 CMR 7.01 and the MassDEP Noise Policy.

Note: These criteria are measured both at the property line and at the nearest inhabited building.

For equipment that operates, or will be operated intermittently, the ambient or background noise measurements shall be performed during the hours that the equipment will operate and at the quietest times of the day. The quietest time of the day is usually between 1:00 a.m. and 4:00 a.m. on weekend nights. The nighttime sound measurements must be conducted at a time that represents the lowest ambient sound level expected during all seasons of the year.

For equipment that operates, or will operate, continuously and is a significant source of sound, such as a proposed power plant, background shall be established via a minimum of seven consecutive days of continuous monitoring at multiple locations with the dBA L 90 data and pure tone data reduced to one-hour averages.

In any case, consult with the appropriate MassDEP Regional Office before commencing noise monitoring in order to establish a sound monitoring protocol that will be acceptable to MassDEP.

E. Full Octave Band Analysis

The following community sound profiles will require the use of sound pressure level measuring equipment in the neighborhood of the installation. An ANSI S1.4 Type 1 sound monitor or equivalent shall be use for all sound measurements. A detailed description of sound monitor calibration methodology shall be included with any sound survey.

1. Lowest **ambient** sound pressure levels during operating hours of the equipment.

   a. At property line:

A-Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
See rpt.										

E. Full Octave Band Analysis (continued)

b. At the nearest inhabited building and if applicable at buildings at higher elevation:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
See rpt.										

Note: You are required to complete sound profiles 2a and 2b only if you are submitting this form in response to a MassDEP enforcement action citing a noise nuisance condition. If this is an application for new equipment, Skip to 3.

2. Neighborhood sound pressure levels with source operating without sound abatement equipment.

a. At property line:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K

b. At the nearest inhabited building and if applicable at buildings at higher elevation:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K

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E. Full Octave Band Analysis (continued)

3. **Expected** neighborhood sound pressure levels after installation of sound abatement equipment.

a. At property line:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
See rpt.										

b. At nearest inhabited building and if applicable at buildings at higher elevations:

A- Weighted	31.5	63.0	125	250	500	1K	2K	4K	8K	16K
See rpt.										

Note: MassDEP may request that actual measurements be taken after the installation of the noise abatement equipment to verify compliance at all off-site locations.

F. Professional Engineers Stamp

The seal or stamp and signature of a Massachusetts Registered Professional Engineer (P.E.) must be entered below. Both the seal or stamp impression and the P.E. signature must be original. This is to certify that the information contained in this Form has been checked for accuracy, and that the design represents good air pollution control engineering practice.

Gregory C. Tocci
P.E. Name (Type or Print)

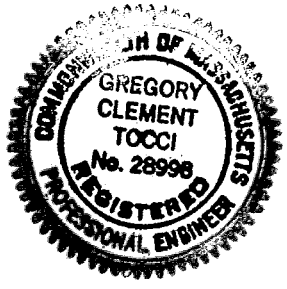
P.E. Signature

Sr. Principal Consultant
Position/Title

Cavanaugh Tocci
Company

September 22, 2025
Date (MM/DD/YYYY)

28998
P.E. Number



G. Certification by Responsible Official

The signature below provides the affirmative demonstration pursuant to 310 CMR 7.02(5)(c)8 that any facility(ies) in Massachusetts, owned or operated by the proponent for this project (or by an entity controlling, controlled by or under common control with such proponent) that is subject to 310 CMR 7.00, et seq., is in compliance with, or on a MassDEP approved compliance schedule to meet, all provisions of 310 CMR 7.00, et seq., and any plan approval, order, notice of noncompliance or permit issued thereunder. This Form must be signed by a Responsible Official working at the location of the proposed new or modified facility. Even if an agent has been designated to fill out this Form, the Responsible Official must sign it. (Refer to the definition given in 310 CMR 7.00.)

I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.

Responsible Official Name (Type or Print)

Responsible Official Signature

Responsible Official Title

Responsible Official Company/Organization Name

Date (MM/DD/YYYY)

This Space Reserved for MassDEP Approval Stamp.