
To:	Michelle Cheek, P.E. Deputy Program Manager Portland Water Bureau	From:	Mark Graham, P.E., PMP Project Manager Stantec
Subject:	Bull Run Filtration Facility Operational Noise Response	Date:	September 5, 2023

In response to the Cottrell CPO Sound Impacts Testimony dated 8/7/2023, this memo provides additional information and context about evidence provided in the Bull Run Filtration Facility Exterior Noise Analysis (Stantec Consulting Services, 2022) prepared for the Bull Run Filtration Facility (Facility), which is in the record as Exhibit A.49, and the nature of the noise that will be generated by the operation of the Facility.

Stantec predicted noise levels at various receiver locations around the project site using the computer program SoundPlan. SoundPlan uses standardized prediction techniques (per ISO 9613) and accounts for distance, topography, vegetation, and the effect of shielding and reflections produced by buildings and acoustic barriers. The results of this study, as well as measurements of existing noise sources, were reported using the decibel (dB) scale, the standard unit for measuring sound levels in science and engineering. Rules and regulations issued by Multnomah County, Clackamas County, OSHA, and other government agencies all use the decibel scale. The decibel scale is logarithmic because a 10 dB increase in sound pressure level is perceived by the human ear as a doubling of loudness. Thus, the decibel scale allows the wide range of sounds perceived by humans to be represented in a manageable range of values. A list of sound levels (in dB) of common sounds was previously provided in the Acoustic Baseline Measurement (The Greenbush Group, 2023, in the record as Exhibit A.172).

During daily operation, the character of the noise generated by the Facility will be consistent with other noise generated in the area, which includes farm equipment, large trucks, irrigation pumps, and ventilation equipment serving farms, businesses and residents. Noise generated at the Facility will include water treatment equipment, water pumps, delivery trucks, and ventilation equipment serving the operations and maintenance buildings. The loudest equipment at the Facility is used only intermittently. Engine generators and the fire pump station are operated only for periodic testing (during the day) or during an emergency. As shown in Table 2 of the Exterior Noise Analysis (Stantec, 2022, Exhibit A.49), without operation of the emergency equipment, noise levels generated by the Facility are below measurements of ambient noise. The Facility will not create a constant background hum; much of the non-emergency equipment will also operate intermittently. For example, filter backwash pumps and filter air scour blowers will typically operate four to six times per day for ten to thirty minutes. The noise analysis evaluated the highest noise levels generated by simultaneous operation of all equipment, including those with intermittent operations. Facility noise generation at property lines during the day will be equivalent to or lower than measurements of background ambient noise and similar in the intermittent character.

Nighttime (10 p.m. to 7 a.m.) ambient noise was reported at six locations along the Facility property line in the Acoustic Baseline Measurement. The existing median hourly nighttime L_{eq} sound levels range between 40 dBA and 50 dBA. The noise levels at the property line generated by the equipment at the Facility (excluding equipment operated only during emergencies), as reported by Facility Exterior Noise Analysis, are predicted to range between 29 and 46 dBA. As shown in Table 1, nighttime noise generated by the facility is within or below the range of measured ambient noise.

Reference: Filtration Facility Operational Noise Response

Location	Measured Leq in dBA ^a min-max (median)	Predicted Non-emergency Equipment Noise Levels as Ld in dBA ^b
Location 1	33-50 (40)	40
Location 2	34-51 (45)	40
Location 3	34-50 (43)	31
Location 4	46-47 (46)	29
Location 5	35-49 (42)	35
Location 6	46-56 (50)	46

a. From Acoustic Baseline Measurement, Greenbusch Group, January 2023.

b. From Filtration Facility Exterior Noise Analysis, Stantec, August 2022.

Because, as previously established, the noise levels at the Facility property line during operation will be within or below the range of current ambient sound levels, and the type of noise generated by the facility will be similar to noises currently existing within the study area, the noise generated by the operation of the Facility will be consistent with the character of the area.