How Noisy is a Landfill?

Presented by:
Kelly Collins, PG, BCES
CDM Smith
Randall Kippenbrock, PE
Santa Fe Solid Waste Management Agency

SFSWMA

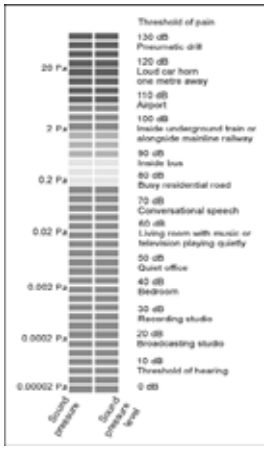
CDM Smith

Why?

- SFSWMA is proposing to expand the Caja del Rio Landfill laterally and vertically to increase its capacity
- This modification will optimize the use of lined areas, maximize the air space, and extend the life of the current landfill by up to 60 years
- If approved by NMED, the landfill will be 70 to 100 ft above ground level and about 4,290 ft from the closest residence
- Noise from the landfill was cited as a concern at a community meeting

Noise Concepts - Sound

- characterized by the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level (amplitude)
- The commonly accepted limits of human hearing are between the threshold of hearing at 0 dB and the threshold of pain at 140 dB.



Measuring Noise

- Environmental sounds vary with time and cannot simply be described with a single number
- Equivalent noise level (Leq) combines noise from individual events and steady state sources into a measure of cumulative noise exposure
- Derived from a large number of moment-to-moment A-weighted noise level measurements

Noise Perception

- Perceived effect of incremental increases in existing noise levels – aim for ≤ 5 dBA
- People have different hearing sensitivity to noise
- Annoyance due to contrast with ambient noise

Sound Level Change (dBA)	Relative Loudness
0	No change
+3	Barely perceptible change
+5	Noticeable change
+10	Twice as loud
+20	Four times as loud

Santa Fe Noise Regulations

- Santa Fe County Code of Ordinances Section 131.21
- These limits cannot be exceeded for more than 5 consecutive minutes or for 10 minutes in any 30 minutes.

Noise limits 25 feet from the exterior perimeter of a noise sensitive unit:

- 60 dBA between 10:00 pm and 7:00 am
- 75 dBA between 7:00 am and 10:00 pm
- 15 dBA above these thresholds are prohibited at any time.

Existing Noise Level Measurements

- Ambient readings taken near the perimeter and outside of the Landfill
- Near noise sources at the landfill
- Noise levels measured for 20 minutes at each location in one minute intervals
- Sources of noise were noted during the noise measurements
- Traffic volume on Caja del Rio Road was counted when measurements were taken

Typical Working Face

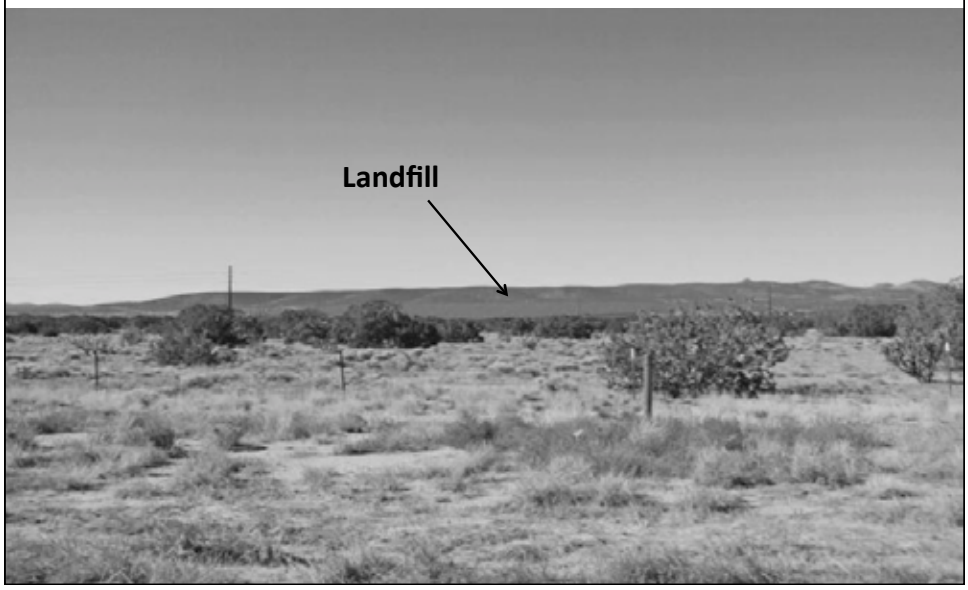
Compactor on Working Face

Landfill Equipment

Noise Levels - Summary

- Working face noise measurements ranged from 75 to 84 dBA (normalized to 50 feet)
- Basalt crushing noise level was normalized to 83 dBA
- Landfill boundary noise levels were 37 to 41 dBA
- Noise levels on Caja del Rio Road were 55 and 59 dBA
- Ambient noise levels in the residential neighborhood estimated to be 50 dBA or less

Landfill Caja Del Rio Rd (Near CR 62) at Closure



Future Working Face Noise Levels

- Predicted using distance and atmospheric attenuation calculations
- Estimated noise level at the receptor was considered with existing ambient levels
- Nearest residence 4,290 feet
- Working face noise level reduced to 43 dBA in residential area
- Ambient noise level is 50 dBA in the residential area

Not expected to significantly increase noise at residences or to exceed Santa Fe County threshold

Future Rock Crushing Noise

- The closest receptor 7,140 feet away
- Approximately 46 dBA decrease
- Estimated 37 dBA at the receptor
- More than 10 dBA less than the existing ambient noise

Noise from Truck Traffic

- Future increase in waste disposal rate could increase daily truck traffic by 10 %
- Total traffic volume on Caja del Rio Road would have to double for a noticeable increase in the noise level.