

18 September 2023

Our Ref. No.: 22EIM09

EIMS

Attention: John von Mayer

**SPECIALIST OPINION ON THE ENVIRONMENTAL NOISE IMPACTS OF THE PROPOSED HARMONY GOLD MINING COMPANY
NOOITGEDACHT AND VALLEY TAILINGS STORAGE FACILITIES**

Harmony Gold Mining Company Limited (Harmony) own and operate a number of Gold Mines and Plants in the Welkom region in the Free State. Harmony currently deposit tailings onto the Free State South (FSS) 2 Tailings Storage Facility (TSF), St. Helena 4 TSF, St. Helena 123 TSF, Dam 23 TSF, Brand D TSF and Target 1&2 TSF. The current planned Life of Mine of the Free State Operations exceed the available deposition capacity of these TSFs and Harmony is undertaking feasibility assessments to construct the new Valley and/or Nooitgedacht TSFs to replace the FSS2 and St Helena 4 TSFs. Airshed Planning Professionals (Pty) Ltd was appointed by Environmental Impact Management Services (EIMS) to provide a specialist opinion on the environmental noise impacts of the two proposed TSFs.

Apart from land clearing activities during the construction phase, tailings storage facilities are not significant generators of noise, with pumps, pipelines, vehicles and diesel mobile equipment operating on or around the TSF being the only noise generating sources. The sound energy from a noise source, specifically when the source dimensions are small compared to the distance to the listener, spreads out spherically, so that the sound pressure level is the same for all points at the same distance from the source and decreases by 6 dB per doubling of distance. This holds true until ground and air attenuation noticeably affect the level. The impact of an intruding industrial noise on the environment will therefore rarely extend over more than 5 km from the source and is always considered "local" in extent.

Noise sensitive receptors (NSRs) in the area (Figure 1) include the town of Welkom, >4 km to the southeast (the closest suburb, Rheederpark, is approximately 3 km east of the Nooitgedacht TSF location), as well as various farmsteads to the north and south of the proposed TSF locations, all more than 4 km away from the proposed TSF locations.

Previous noise surveys around the area have found that the area has a very complex sound character. Areas away from busy roads and mining activities are very quiet, with measurement locations closer to houses, busy roads, agricultural activities and mining activities indicating higher sound levels. Vegetation growth closer to dwellings creates habitat, attracting birds and insects, which in turn make sounds that increases the ambient sound levels. Grassland vegetation also increases wind-induced noise. The larger area, away from roads, dwellings and mining activities can be rated as having a rural acoustic climate, as per the SANS 10103:2008 criteria, with daytime noise levels at or below 45 dBA and night-time levels at or below 35 dBA, but with significant seasonal variation in natural sound created by birds and insects.

Despite the relatively quiet baseline acoustic climate, it can be concluded that the Nooitgedacht and Valley TSFs, due to their nature as no- or low noise generating sources, as well as the large distance between the proposed TSF locations and the closest NSR locations, will have no significant impact on the acoustic climate in the area and will result in no change from baseline conditions at NSR locations..

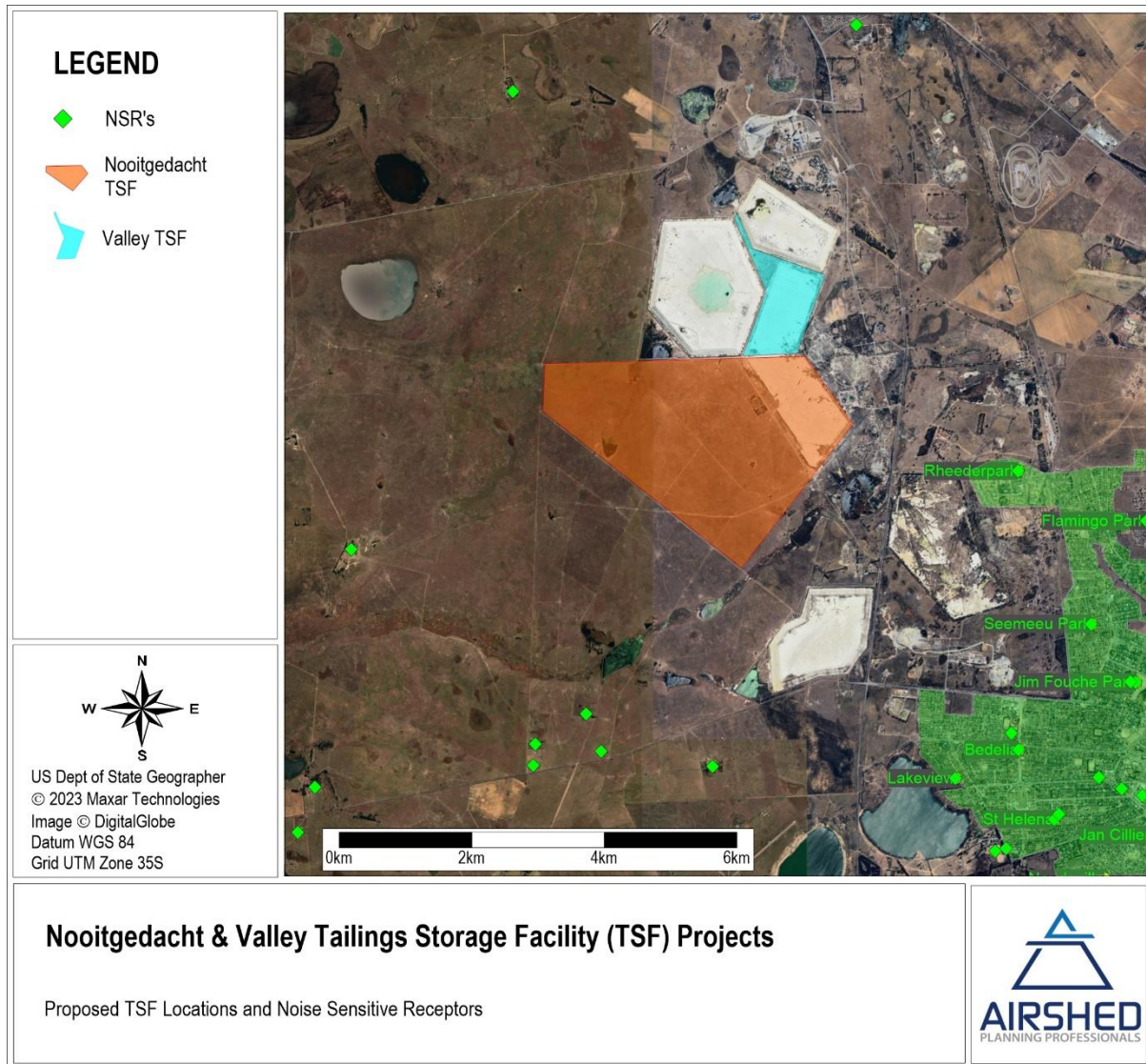


Figure 1: Valley and Nooitgedacht TSF Locations in relation to the town of Welkom and other NSRs.

Please feel free to contact me if you have any questions.

Yours sincerely,

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