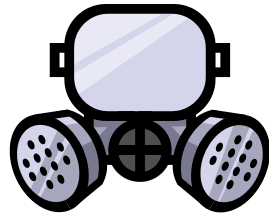


NGULULU RESOURCES



ENVIRONMENTAL NOISE SURVEY REPORT

OCTOBER 2013

VARICON cc

CK95/45511/23

TECHNICAL VERIFICATION

The results and related data have been obtained through careful and precise execution of recognized methods of analysis and evaluation and are related only to the scope of work covered in this report and to the prevailing conditions at the time of the assessment. The opinions and interpretations are embraced through judgement, discernment and comprehension to the best of available knowledge.

Fieldwork and report compilation performed by:

A handwritten signature in black ink, appearing to read 'C F Meyer', is positioned above the printed name.

C F MEYER

(NC: NOISE & POLL. CONTROL; MEC CERT.)

DATE: OCTOBER 2013

1. INTRODUCTION

Ngululu Resources, a proposed opencast coal mine with an estimated Life of Mine (LoM) of 20 years, is planned on portion 26, 46 and 47 of the farm Droogenfontein 242 IR. The proposed site with corresponding farm portions is approximately 15km south-west of Delmas Town in the Victor Kanye Local Municipality (VKLM), as part of the Nkangala District Municipality (NDM), Mpumalanga Province.

2. ENVIRONMENTAL NOISE SURVEY

Stationery noise levels were measured at pre-selected positions around the proposed mining areas. This forms part of the strategy to determine a baseline set of measurements against which any future noise source activities, related to the proposed mining actions, can be compared with.

Two sets of measurements were taken during the daytime in the month of October 2013.

Noise is defined as an unwanted, disturbing and/or physiologically damaging sound. Personal exposures to noise levels equal to, or above 85 dBA for eight hours can cause hearing loss.

In terms of sound pressure levels measured in the environment around the perimeter of any operation the definition and understanding of noise levels can be best described in terms of annoyance amongst the workers and community and not in particular the cause of hearing damage.

Many characteristics are important in the generation of annoyance. As the intensity of the noise increases, the more annoying it becomes.

High frequencies, above 1000Hz, are more annoying than lower frequencies. In addition, if the noise is intermittent, irregular or rhythmic or contains impulses or recognizable pure tones, it may be considerably more annoying than a steady noise of the same intensity or even the same perceived loudness.

The measurement positions were selected around the proposed mining areas and at specific locations around the farmlands.

The noise levels all were measured within the recommended levels that could cause disturbance to any community that could be affected.

Currently the noise levels around the proposed mining sites are mainly generated by chicken farming activities and small scale farming activities. (Portion 26).

Portions 46 and 47 are situated next to a main railway line and the main road (R555) between Delmas and Springs. Noise generation is obviously resulting from the road traffic and the train passing on scheduled times.

3.1 STATUTORY REQUIREMENTS/STANDARDS

The sound levels were evaluated against the standards as specified in the SABS Code of Practice 0103 of 2008 (The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication) with reference to Code SABS 0328 of 2003 (Environmental Noise Impact Assessments).

For the purpose of this survey and according to SABS 0103 of 2008, it is probable that the noise will be annoying, or otherwise intrusive to the community, or to a group of people, if the rating level of the ambient noise under investigation exceeds the typical rating levels for the ambient noise as given in Table 1 below. Applicable values in the tabulation are highlighted.

TABLE 1: TYPICAL RATING LEVELS FOR AMBIENT NOISE IN DISTRICTS

1	2	3	4	5	6	7
Type of District	Equivalent Continuous Rating Level ($L_{Req,T}$) for Ambient Noise					
	Outdoors			Indoors, with open windows		
	Day-night	Day-time	Night-time	Day-night	Day-time	Night-time
(a) Rural Districts	45	45	35	35	35	25
<i>(b) Suburban with little road traffic</i>	50	50	40	40	40	30
(c) Urban Districts	55	55	45	45	45	35
<i>(d) Urban districts with some workshops, business premises and with main roads.</i>	60	60	50	50	50	40
(e) Central Business Districts	65	65	55	55	55	45
(f) Industrial Districts	70	70	60	60	60	50

Note: The values given are A-weighted sound pressure levels and include corrections for tonal character and impulsiveness of the noise

3.2 INSTRUMENTATION AND METHODS

(a) Sampling Method

The method for evaluating workplaces for annoyance and/or a reduction in the quality of telephonic conversations prescribed in the SABS Code of Practice 0103 of 2008 was used to record data during the survey.

The area noise measurements was carried out using a Quest 1900 integrating sound levels meter (serial number CC5070013), which meets IEC651 and IEC804 type 1 requirements. The instrument was calibrated by M&N Acoustic Services calibration laboratory and the calibration was checked with the use of a Quest Acoustic Source before and after use.

(The calibration certificate is attached as Figure 1).

3.3 TEST CONDITIONS

The following environmental conditions were present during the survey periods.

Table 2: Test conditions

TIME	WIND SPEED	WIND DIRECTION	HUMIDITY	AIR TEMPERATURE
8:30 – 12:00 (Day time)	Strong wind blowing	Easterly Direction	15%	20,5 °C – 28,5 °C
9:00 – 11:00 (Night time)	Mild wind blowing	Easterly Direction	15%	12,5 °C – 14,0 °C

3.4 TEST RESULTS

The day-time weather conditions were sunny and warm in the open areas with a strong wind blowing in an Easterly direction. The test results are displayed separately for Portions 46 & 47 and for Portion 26 due to the difference in geographical positions. The test results are compared to the typical rating levels (Category D for Portions 46 & 47) and (Category B for Portion 26) (assumed to be best fit) as provided in Table 1 shown above.

The results of the environmental noise surveys are listed below in Tables 3 and 4:

The reflected values in the table below represent the noise levels of the relevant sampling positions as described. All substandard readings (*rated against the “B” and “D” band requirements in Table 1*) are presented in **Bold and Italic**.

Activities that could contribute to the noise levels measured, on and around the premises, were limited and the main noise sources were main road traffic, train movement, light road vehicles on the farm roads and to a lesser extend some farming activities.

Attached to this report is an Aerial Map downloaded from Google Earth with the various sampling positions Shown as Figure 2.

TABLE 3: NOISE LEVELS AT VARIOUS SAMPLING LOCATIONS AROUND THE PROPOSED MINING SITES (PORTIONS 46 & 47).

Measuring Positions	AMBIENT NOISE (dB(A))					Remarks
	Day Time Levels					
	Average Results (dBA)		Typical Rating (SABS 0103) (Category D)	Excess $\Delta L_{Req.T}$ (dBA)		
	October 2013	October 2013		October 2013	October 2013	
Position 1: On the Eastern Corner of Portion 46, next to the dirt road and next to the railway tracks.	45,1	48,6	60,00	-14.9	-11.4	<u>Day Time:</u> - No mining activities. Mainly noise from neighbouring farms, workshops and main road traffic.
Position 2: On the South-Eastern corner of Portion 46, approximately 500 m from the railway tracks.	35,7	39,8	60,00	-24.3	-20.2	<u>Day Time:</u> - No mining activities. Mainly noise from neighbouring farms, workshops and main road traffic.
Position 3: On the South-Western of Portion 47, approximately 500m from the railway tracks.	41.8	39,7	60,00	-18.2	-20.3	<u>Day Time:</u> - No mining activities. Mainly noise from neighbouring farms, workshops and main road traffic.
Position 4: On the North-Eastern Corner of Portion 47, next to the dirt road and next to the railway	45.4	48.4	60,00	-14.6	-11.6	<u>Day Time:</u> - No mining activities. Mainly noise from neighbouring farms, workshops and main road traffic.

Ambient Noise: The totally encompassing sound in a given situation at a given time and usually composed of sound from many sources both near and far.

TABLE 4: NOISE LEVELS AT VARIOUS SAMPLING LOCATIONS AROUND THE PROPOSED MINING SITE (PORTIONS 26).

Measuring Positions	AMBIENT NOISE (dB(A))					Remarks
	Day Time Levels					
	Average Results (dBA)		Typical Rating (SABS 0103) (Category B)	Excess $\Delta L_{Req,T}$ (dBA)		
	October 2013	October 2013		October 2013	October 2013	
Position 1: On the North-Western corner of the farmland, close to the Chicken farm structures.	41,1	38,6	50,00	-8.9	-11.4	<u>Day Time:</u> - No mining activities. Mainly background noise from birds, background noises and some dirt road traffic.
Position 2: On the North-Eastern corner of the farmland, next to the graveyard, approximately 1000 m from the farmhouse.	35,7	29,8	50,00	-14.3	-20.2	<u>Day Time:</u> - No mining activities. Mainly background noise from birds, background noises and some dirt road traffic.
Position 3: On the South-Eastern corner of the farmland, next to a main dirt road, approximately 1000 m from farmhouses.	31.8	29,7	50,00	-18.2	-20.3	<u>Day Time:</u> - No mining activities. Mainly background noise from birds, background noises and some dirt road traffic.
Position 4: On the South-Western corner of the farmland, next to a main dirt road, approximately 1000 from farmhouses.	31.4	30.4	50,00	-18.6	-19.6	<u>Day Time:</u> - No mining activities. Mainly background noise from birds, background noises and some dirt road traffic.

3.5 CLOSING REMARKS

These measurements were conducted as an initial baseline survey for proposed future mining activities on Portions 26, 46 and 47. The purpose of these surveys is to establish a database that can be used in future to compare the possible disturbance levels created from any future mining or any other activities on these sites. All noise levels measured were below the prescribed requirements (*Column “B&D” in Table 1*). Once the proposed mining activities commence, the Environmental Noise Levels should be measured on a regular basis to determine the effect on the surrounding communities.

All Noise Levels were determined in accordance with the standards as set in SABS 0103 of 2008 under the guidance of SABS 0238:2003 and the typical ratings provided that would best fit the conditions and situation.

Table 5 below indicates the typical response that can be expected from a community taking into consideration excess noise levels when measured against the listed ratings in Table 1.

TABLE 5: CATEGORIES OF COMMUNITY/GROUP RESPONSE

1	2	3
Excess ($\Delta L_{Req,T}$) (dBA)	Estimated Community/Group Response	
	Category	Description
0	None	No observed reaction
0 to 10	Little	Sporadic complaints
5 to 15	Medium	Widespread complaints
10 to 20	Strong	Threats of community or group actions
>15	Very Strong	Vigorous community or group actions

NOTE: Overlapping ranges for the excess values are given because a spread in the community reaction might be anticipated

$\Delta L_{Req,T}$ Should be calculated from the appropriate of the following:

- $L_{Req,T}$ of the ambient noise under investigation MINUS $L_{Req,T}$ of the residual noise.
- $L_{Req,T}$ of the ambient noise under investigation MINUS the maximum rating level for the ambient noise given in Table 1.
- *$L_{Req,T}$ of the ambient noise under investigation MINUS the typical rating level for the applicable district as determined from Table 1.*
- Expected increase in $L_{Req,T}$ of ambient noise in an area because of a proposed development under investigation.

CERTIFICATE OF CALIBRATION

CERTIFICATE NUMBER	2012-1470
ORGANISATION	VARICON
CALIBRATION OF	INTEGRATING SOUND LEVEL METER and ½" MICROPHONE
CALIBRATED BY	M. NAUDÉ
MANUFACTURER	QUEST
MODEL NUMBERS	1900 and 4146
SERIAL NUMBERS	CC 5070013 and 17685
DATE OF CALIBRATION	3 OCTOBER 2012
RECOMMENDED DUE DATE	OCTOBER 2013
PAGE NUMBER	PAGE 1 OF 3

This certificate is issued in accordance with the conditions of approval granted by the South African National Accreditation System (SANAS). This Certificate may not be reproduced without the written approval of SANAS and M and N Acoustic Services.

Calibrations performed by this laboratory are in terms of standards, the accuracies of which are traceable to national measuring standards as maintained by NMISA

The measurement results recorded in this certificate were correct at the time of calibration. The subsequent accuracy will depend on factors such as care, handling, frequency of use and the amount of different users. It is recommended that re-calibration should be performed at an interval, which will ensure that the instrument remains within the desired limits and/or manufacturer's specifications.

The South African National Accreditation System (SANAS) is member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). This arrangement allows for mutual recognition of technical test and calibration data by member accreditation bodies worldwide. For more information on the arrangement please consult www.ilac.org


M.W. DE-BEER (SANAS TECHNICAL SIGNATORY)


DATE OF ISSUE

Only Member : Marianka Naudé

Figure 1: CALIBRATION CERTIFICATE SOUND LEVEL METER

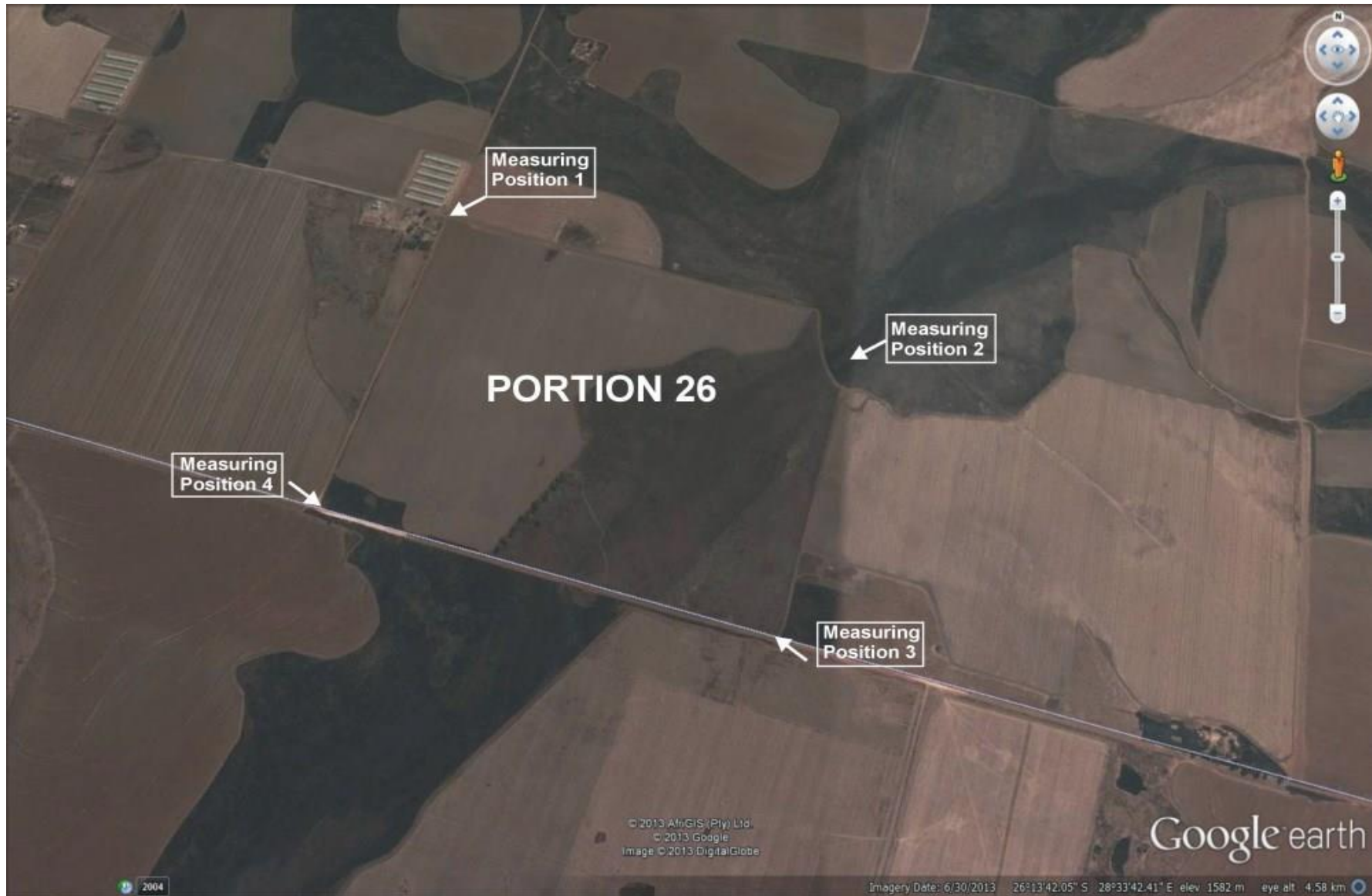


Figure 2: Google image of portion 26 showing all noise monitoring positions



Figure 3: Google image of portions 46 & 47 showing all noise monitoring positions