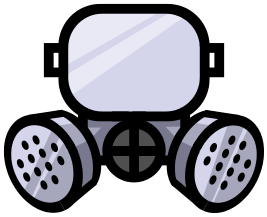
CHINA AFRICAN PRECIOUS METALS PTY (LTD)

ORKNEY GOLD MINE (CAPM)



ENVIRONMENTAL NOISE IMPACT ASSESSMENT REPORT

MARCH 2015

Compiled by: C F Meyer

VARICON cc

CK95/45511/23

SHORTENEND CURRICULUM VITAE FOR C F MEYER

Relevant Experience:

34 years practical experience in:-

- Occupational Hygiene measurements
- Underground and surface occupational and engineering environmental control, which includes noise control and pollutants control and airflow management

Performed environmental noise surveys and impact assessments for environmental agencies such as Shangoni Management Services since 2009.

Relevant Qualifications:

Chamber of Mines Certificate in Mine Environmental Control
(Copy attached as Figure 10)

National Certificate in Noise Control
(Copy attached as Figure 11)

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:

C F MEYER **DATE: MARCH 2015**

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

1. INTRODUCTION

CAPM requested Shangoni Management Services (Pty) Ltd to submit a proposal for a baseline Environmental Noise Impact Assessment for the updating of the CAPM Environmental Management Programme (EMP) and Integrated Water and Waste Management Plan (IWWMP) for submission to the Department of Mineral Resources (DMR) and the Department of Water and Sanitation (DWS), respectively.

An Environmental Noise survey was conducted around the seven shaft positions as shown in Figure 1, and although not all the shafts will be operational again, this study will serve as a complete baseline survey to be used in the process of updating the CAPM EMP.

This report shows and discusses the results from the surveys around the perimeters of the seven (7) shafts. The report also provides an impact assessment of any possible future activities with specific reference to shafts No. 6 and 7, which will be used in the near future. All other shafts will be under care and maintenance until further notice.

It must be mentioned that the impact assessment performed, is a subjective evaluation from the author and it is advisable that once the operations are active again, these studies should be repeated to obtain more accurate values.

2. CLIENT DESCRIPTION

CAPM Orkney Gold Mine is an existing mine located in the North-West Province, South Africa. The mine consists of seven (7) shaft areas and is currently non-operational and under care and maintenance.

Refer to Figure 1 below for a Google image of the location of the seven (7) shaft areas. However, when operations commence, only the No. 6 and No. 7 shafts will be used and the No 1-4 shafts will remain under care and maintenance until such a time as when they will again be utilized or demolished.

The mining method consists of the standard deep level underground, stoping layout for extraction of narrow generally flat dipping gold reefs occurring deeper than 500m below surface. A maximum of 40 ktpm raw materials are transported by road to Nicolor South Plant located on the property of Buffelsfontein Gold Mine. Therefore, CAPM Orkney Gold Mine does not have, and will not have, any residue deposits.

Figure 1: CAPM Orkney Gold Mine – Seven (7) shaft areas

3. ENVIRONMENTAL NOISE SURVEYS

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 perimeters of the existing shafts, or previous shaft positions before being demolished. The actual sampling positions are displayed on Google images that represents the individual shaft positions. (Refer to Figures 2 to 8).

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

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 2008 (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**
(b) Suburban with little road traffic	**50**	**50**	**40**	**40**	**40**	**30**
(c) Urban Districts	**55**	**55**	**45**	**45**	**45**	**35**
(d) Urban districts with some workshops, business premises and with main roads.	**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 were carried out using a Quest 1900 integrating Sound Level Meter (SLM) (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.

Refer to Figure 9 for the calibration certificate for the Quest SLM.

3.3 TEST CONDITIONS

The following environmental conditions were present during the survey periods.

TIME	WEATHER CONDITIONS	WIND DIRECTION	HUMIDITY	AIR TEMPERATURE
10:00 – 14:00 (Day time))	Strong wind blowing, partly cloudy to cloudy conditions.	North-Westerly Direction	25%	20,5 ^{0}C – 27,0 ^{0}C

3.4 TEST RESULTS

The test results were compared to the typical rating levels (Category E) (assumed to be best fit) as provided in Table 1 shown above.

The results of the environmental noise surveys around the seven (7) shafts are tabulated below in Table 2: Difficulty in gaining access to the sites often made it only possible to measure at two or three representative positions.

The reflected values in the table below represent the noise levels of the relevant sampling positions as described. All substandard readings are presented in **Bold and *Italic*.**

All the shafts are dormant at the moment and in some instances the shaft complex had been demolished. The only activities that were noted were unrelated to mining, but included activities such as vehicle movement on the main roads, human activities from the residential areas, activities from storage yards and rehabilitation activities from waste dumps.

For ease of identification on the sampling positions, please refer to the Google images at the end of the report that shows the various sampling positions for each individual Shaft complex. (Figures 2 to 8)

TABLE 2: ENVIRONMENTAL NOISE LEVELS MEASURED AROUND THE SHAFT PERIMETERS AT VARIOUS SAMPLING LOCATIONS.

Measuring Positions (Co-ordinates)	AMBIENT NOISE (dB(A)) Day Time Levels			Remarks
	Average Measured Results	Typical Rating (SABS 0103) (Category E)	Excess $\Delta L_{Req,T}$ (dBA)	
SHAFT COMPLEX No. 1				
Position 1: 26^{0}56'14.01"S 26^{0}44'15.11"E	49.7	65.0	+15.3	Close to the workers residential complex. At the main entrance to the shaft complex and old parking area. Vehicles and people traveling. No mining activities
Position 2: 26^{0}56'12.91"S 26^{0}44'20.66"E	48.7	65.0	+16.3	Main noise contributors were people talking and general background noise. Close to workshop areas not related to the old shaft complex.
Position 3: 26^{0}56'20.24"S 26^{0}44'10.16"E	45.7	65.0	+19.3	General background noise. Next to the old waste dump. Strong winds blowing. No mining activities.
SHAFT COMPLEX No. 2				
Position 1: 26^{0}55'59.51"S 26^{0}45'46.07"E	42.4	65.0	+22.6	At the main entrance to the shaft next to the main traveling road. Mainly vehicle noise contributing.
Position 2: 26^{0}56'04.67"S 26^{0}45'59.21:E	46.8	65.0	+18.2	Measuring point close to a salvage yard. Noise generation not relevant to the focus of this survey. No mining activities.
Position 3: 26^{0}56'03.60"S 26^{0}45'39.07"E	41.2	65.0	+23.8	At the back of the hostel and the shaft complex. Only general background noise.

TABLE 2: ENVIRONMENTAL NOISE LEVELS MEASURED AROUND THE SHAFT PERIMETERS AT VARIOUS SAMPLING LOCATIONS.				
SHAFT COMPLEX No. 3				
Measuring Positions	**AMBIENT NOISE (dB(A))** **Day Time Levels** **Average Measured Results**	**Typical Rating (SABS 0103) (Category E)**	**Excess $\Delta L_{Req,T}$ (dBA)**	**Remarks**
Position 1: 26^{0}56'55.33"S 26^{0}43'09.51"E	46.1	65.0	+18.9	This shaft complex has been completely demolished. There were no mining activities that could contribute to the noise levels. General noise from traffic on the distant main road was evident.
Position 2: 26^{0}56'59.49"S 26^{0}42'59.96"E	49.2	65.0	+15.8	Next to the main substation and close to the main road. Vehicle traffic was the main noise contributor.
SHAFT COMPLEX No. 4				
Position 1: 26^{0}54'56.07"S 26^{0}42'31.04"E	48.5	65.0	+16.5	At the old main entrance to the shaft complex. Close to the main road, but no alternative activities recorded.
Position 2: 26^{0}55'03.58"S 26^{0}42'46.27"E	41.6	65.0	+23.4	Remote from any activities and remote from the main road. General background noises.
Position 3: 26^{0}55'06.93"S 26^{0}42'33.58"E	47.2	65.0	+17.8	Rehabilitation of old waste dumps ongoing. The noise generated not relevant to the focus of this survey. Directly behind the old shaft complex. No activities from within the shaft complex.
SHAFT COMPLEX No. 5				
Position 1: 26^{0}54'42.10"S 26^{0}45'09.48"E	50.5	65.0	+14.5	Close to the workers residence complex. Extensive vehicle and people movement which were the main contributing factors. The Shaft complex will be demolished and cleared in time, but the residential complex will be reserved.
Position 2: 26^{0}55'01.41"S 26^{0}45'05.39"E	42.7	65.0	+22.3	At the back of the old shaft, remote from the traffic. Distant noises from the main road and some general background noises.
Position 3: 26^{0}54'51.44"S 26^{0}45'11.80"E	34.8	65.0	+30.2	Moving around the shaft complex where the main fans used to be. Very quiet area. Only background and veld noises.

TABLE 2: ENVIRONMENTAL NOISE LEVELS MEASURED AROUND THE SHAFT PERIMETERS AT VARIOUS SAMPLING LOCATIONS.				
SHAFT COMPLEX No. 6				
Measuring Positions	**AMBIENT NOISE (dB(A))** **Day Time Levels**			**Remarks**
	Average Measured Results	**Typical Rating (SABS 0103) (Category E)**	**Excess $_{\Delta}L_{Req,T}$ (dBA)**	
Position 1: $26^0$58'09.47"S $26^0$39'37.68"E	51.1	65.0	+13.9	Close to the main entrance, next to the main substation and old parking area. Noise from the substation and road traffic were the main noise contributors. No noise from the shaft complex.
Position 2: $26^0$58'06.46"S $26^0$39'34.44"E	45.0	65.0	+20.0	Closer to the northern side of the head gear, outside of the main fence. General background noise and some people walking through the veld. This shaft complex will be re-opened and production will commence in the near future.
Position 3: $26^0$58'10.12"S $26^0$39'30.03"E	45.7	65.0	+19.3	Back of the shaft, next to main road and close to the residential areas. Also close to industrial areas. No noise from the mining area. General residential and industrial noise.
SHAFT COMPLEX No. 7				
Position 1: $26^0$57'12.60"S $26^0$40'08.23"E	56.6	65.0	+8.4	Northern corner of the complex, close to the reduction plant. Plant is still operating and used for the treatment of the raw material. Although the shaft is not active, the plants and yards are still active and generating noise.
Position 2: $26^0$57'27.51"S $26^0$40'12.41"E	51.7	65.0	+13.3	Towards the back of the existing residential complex of the workers. This shaft complex will be re-opened and production will commence in the near future. Currently only noise from the road traffic and from human traffic is evident.
Position 3: $26^0$57'15.73"S $26^0$40'30.54"E	48.2	65.0	+16.8	Back entrance to the shaft complex. Remote from the reduction plants. Some noise from material handling in the yards were noted.

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.*

3.5 REMARKS ON SAMPLING RESULTS

All Noise Levels were determined in accordance with the standards as set in SABS 0103 of 2008 under the guidance of SABS 0328:2008 and the typical ratings provided that would best fit the conditions and situation.

All measurements recorded were below the statutory levels as stipulated in Table 1 under the "E" category that was chosen as the best fit for the current situations.

It is again emphasized that these measured results are only applicable as a baseline study for the purpose of updating the current EMP of CAPM. Should the mining activities at these individual shafts commence in future, these measurements should be repeated and compared with the baseline levels. These follow-up results should then still comply with the statutory requirements as shown and managed as stated in the approved EMP of the mine.

According to the existing future planning, only the No.6 and No.7 shafts will be re-opened and brought to full production. This will most certainly have an impact on the noise levels generated and should be monitored.

Table 3 below indicates the typical response that can be expected from a community taking into consideration excess noise levels when measured against the listed rating in Table 2.

TABLE 3: 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 2.***
- Expected increase in $L_{Req,T}$ of ambient noise in an area because of a proposed development under investigation**.**

4. IMPACT STATEMENT AND ASSESSMENT

Activities	Significance of impact	Degree to which impact can be reversed	Degree to which impact may cause irreplaceable loss	Cumulative Impact	Mitigation possibility
SHAFTS No.6 & No.7 TO BE RE-OPENED FOR PRODUCTION					
Currently the shafts are not producing and the noise levels are from normal background noise and activities originating from human interaction and vehicle. In the not too distant future these shafts will be re-opened and the prepared for production. This will include activities such as pumping of water and replacing structures that are worn and damaged. Through this process there will be a great deal of workshop and construction activities and vehicle movement while the shafts and underground workings are prepared. Once operational again the main noise sources will be from the main surface fans and the normal shaft noises.	The impact on the environment of the described underground activities should not be significant as most of the work will be underground. The surface activities as mentioned should have a more definite impact, but should not be very significant as the surrounding residential areas are fairly remote from the actual shafts and the planned activities.	Judging by the baseline levels that were measured and presented in the main body of this report, the mentioned activities should not be significant. The impact during the construction phase will lessen as the construction is complete and normal mining proceed. Historical data has shown that the noise levels generated through the normal mining activities are in general below the statutory requirements.	The impact will not be significant and therefore there should be no loss of resources	Non envisaged	• Effective maintenance of the vehicle engines and exhaust systems. • Hearing conservation programme as per DMR guidelines on Noise Control. • Zoning of high noise areas. • The use of approved hearing protection devices for personnel working in close proximity of the workings. • Incorporate sound attenuation measures to any equipment that could generate noise levels in excess of the statutory limits as published by the Department of Mineral and Energy. • From an occupational perspective the mine workers should be protected through standards and procedures and the personal exposure levels should be monitored as part of the legal requirements of Section 12 of the MHSA.

Activities	Significance of impact	Degree to which impact can be reversed	Degree to which impact may cause irreplaceable loss	Cumulative Impact	Mitigation possibility
SHAFTS 1 to 5 WILL ONLY BE UNDER CARE AND MAINTENANCE					
Proposed activity: These shaft will not be re-opened again for production. Normal care and maintenance will be carried on these shafts. Should there be any additional activities carried out, such as the breaking down of shaft structures and buildings, the noise levels should be monitored and the necessary control measures be introduced to minimise the impact on the community.	The baseline results of the surveys as presented in the main body of this report, show very low noise levels. It is not envisaged that these levels will be increase significantly during the care and maintenance of the shaft complexes, therefore the impact will not be significant.	There should be no significant impact, provided that the planned care and maintenance of these shafts are not deviated from.	The impact will not be significant and therefore there should be no loss of resources	Non envisaged	• Effective maintenance of the vehicle engines and exhaust systems. • Hearing conservation programme as per DMR guidelines on Noise Control. • Zoning of high noise areas. • The use of approved hearing protection devices for personnel working in close proximity of the workings. • Incorporate sound attenuation measures to any equipment that could generate noise levels in excess of the statutory limits as published by the Department of Mineral and Energy. • From an occupational perspective the mine workers should be protected through standards and procedures and the personal exposure levels should be monitored as part of the legal requirements of Section 12 of the MHSA.

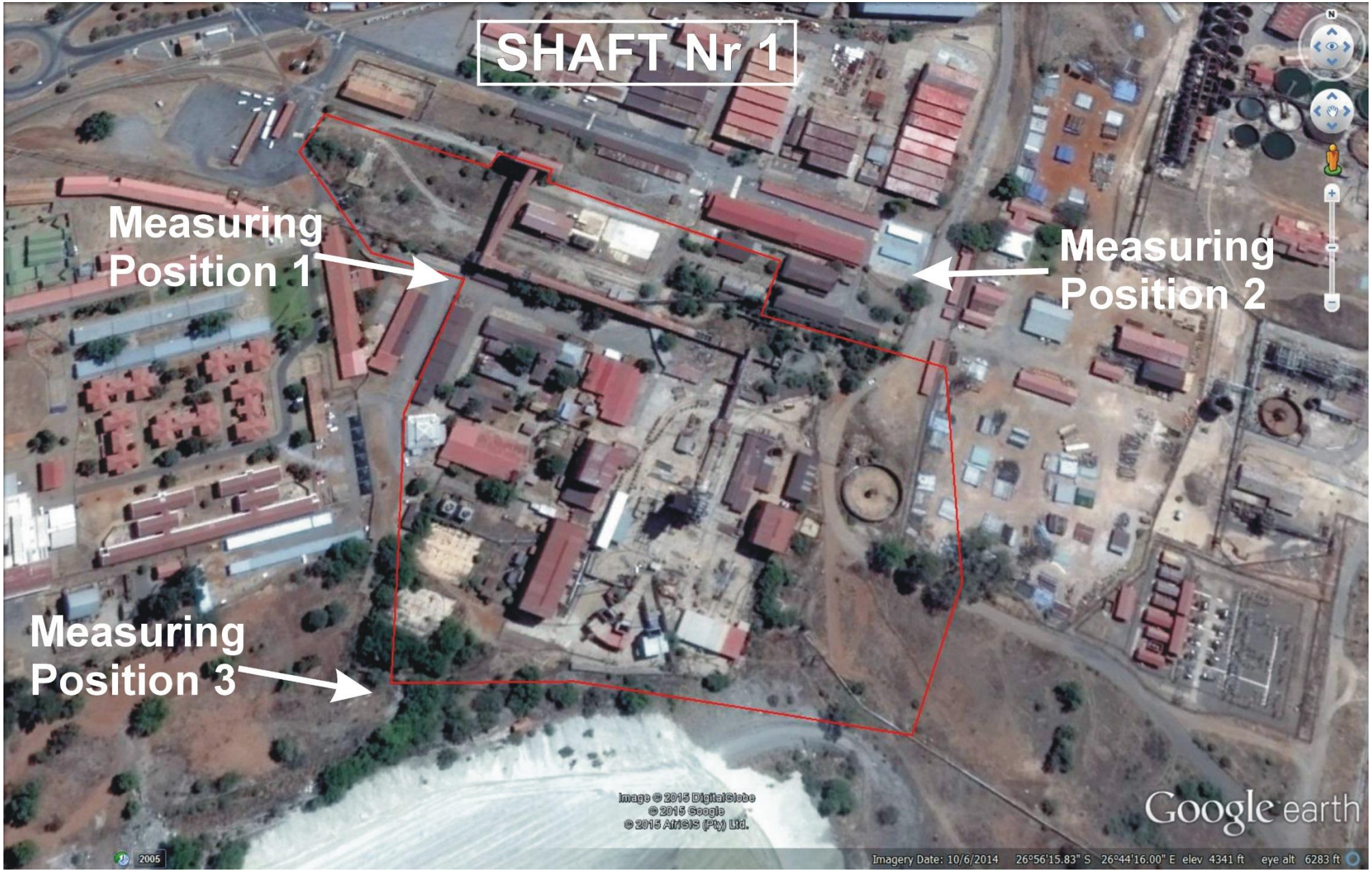


Figure 2: CAPM Orkney Gold Mine – Shaft Nr 1

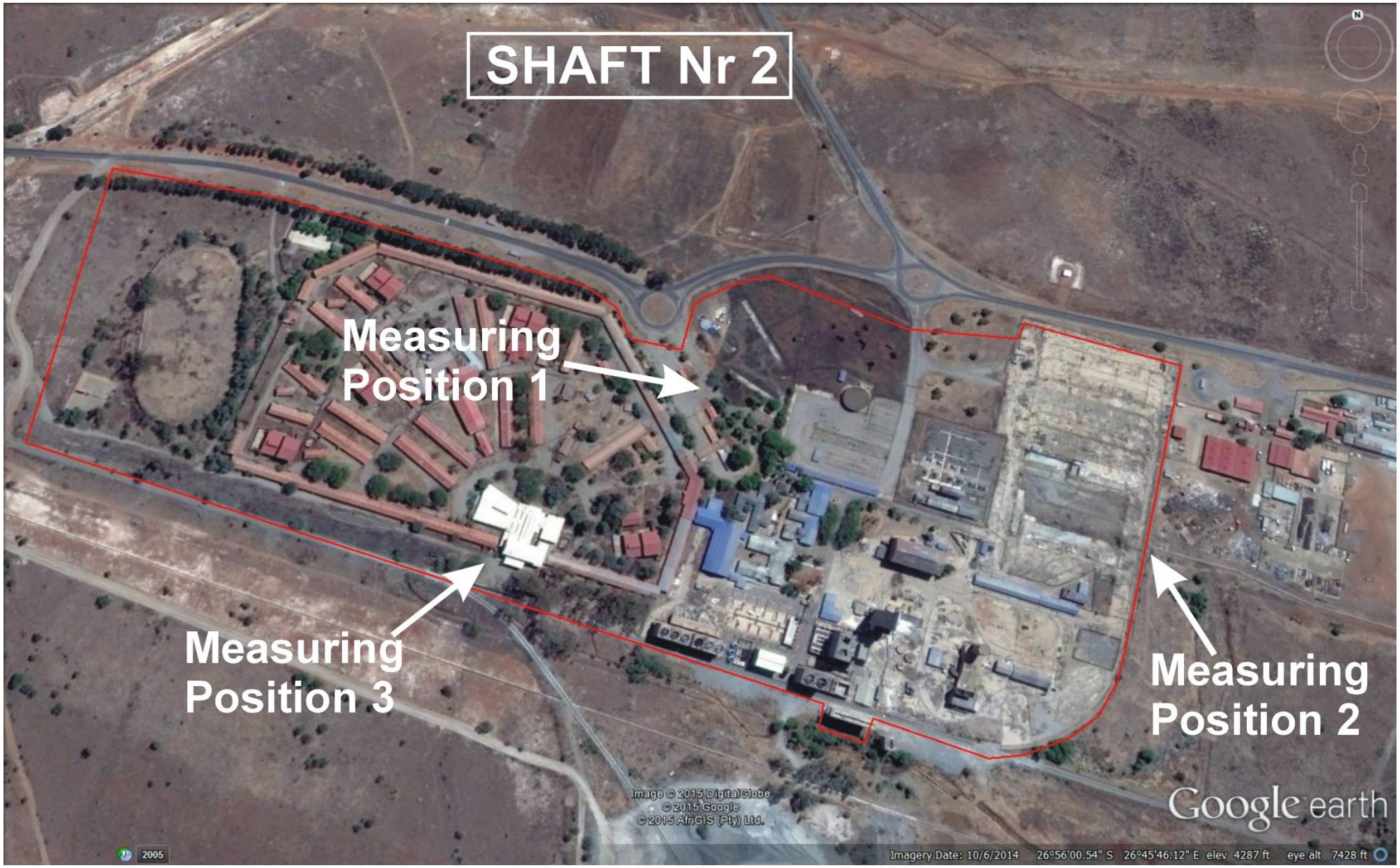


Figure 3: CAPM Orkney Gold Mine – Shaft Nr 2

Figure 4: CAPM Orkney Gold Mine – Shaft Nr 3

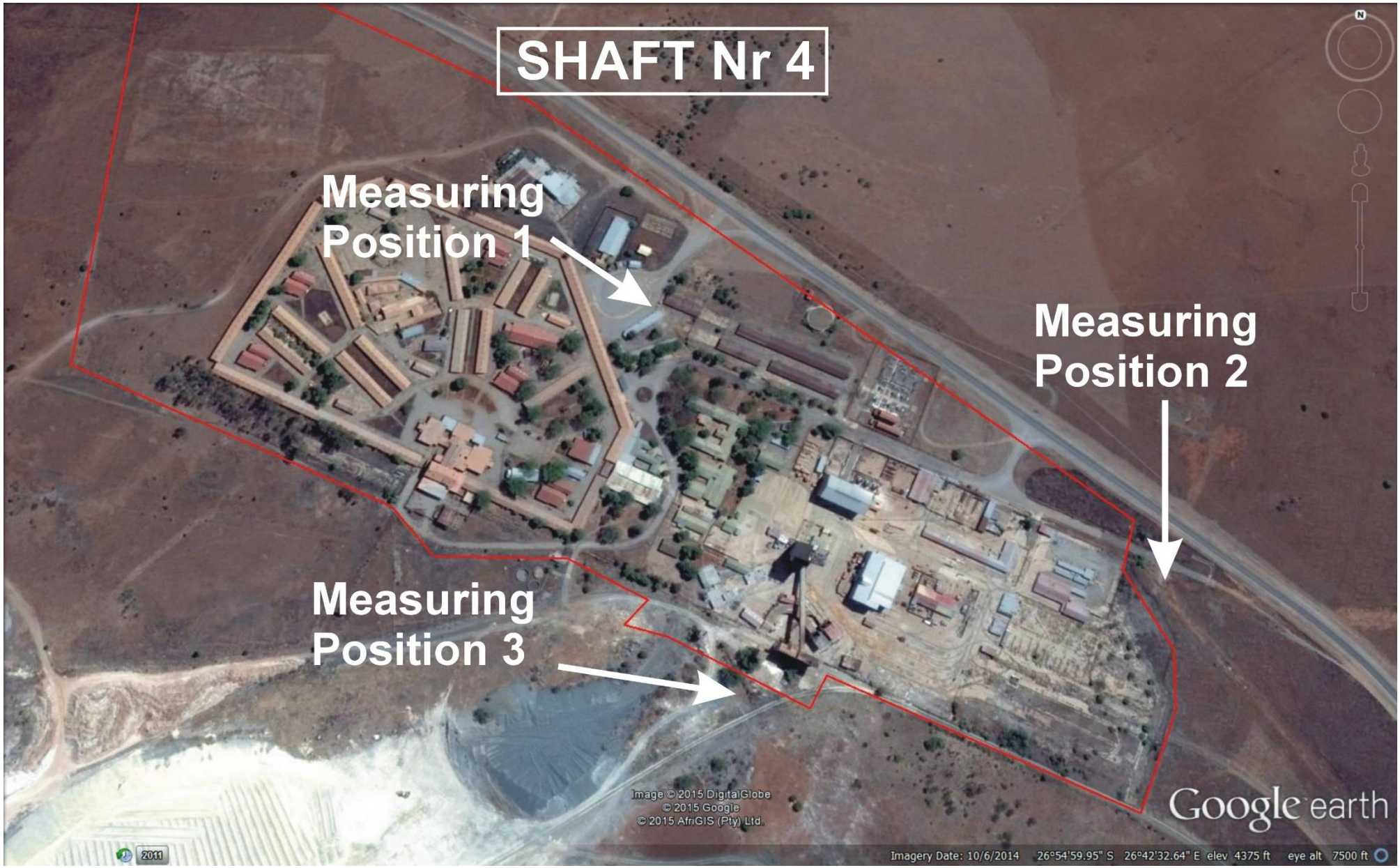


Figure 5: CAPM Orkney Gold Mine – Shaft Nr 4

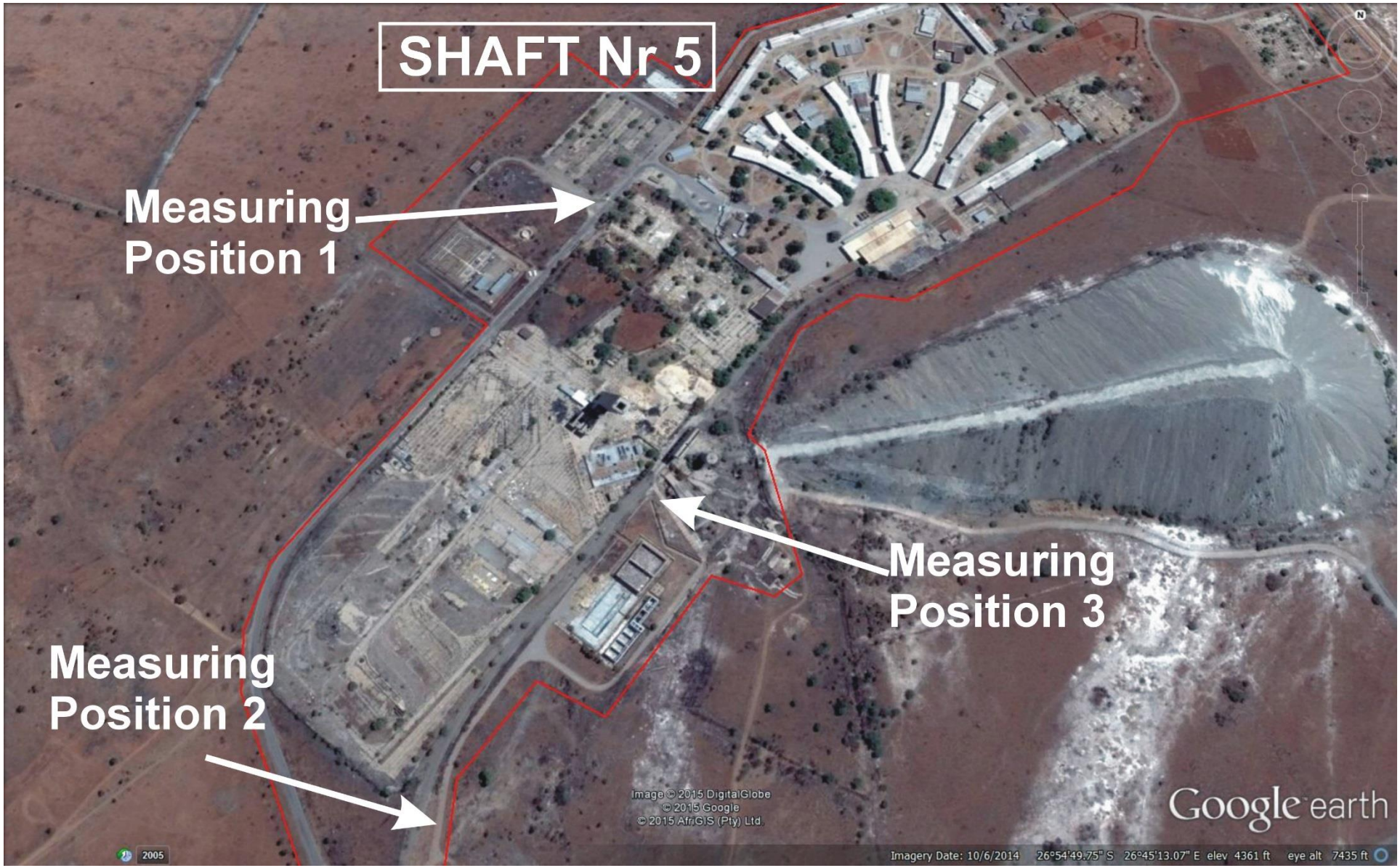


Figure 6: CAPM Orkney Gold Mine – Shaft Nr 5

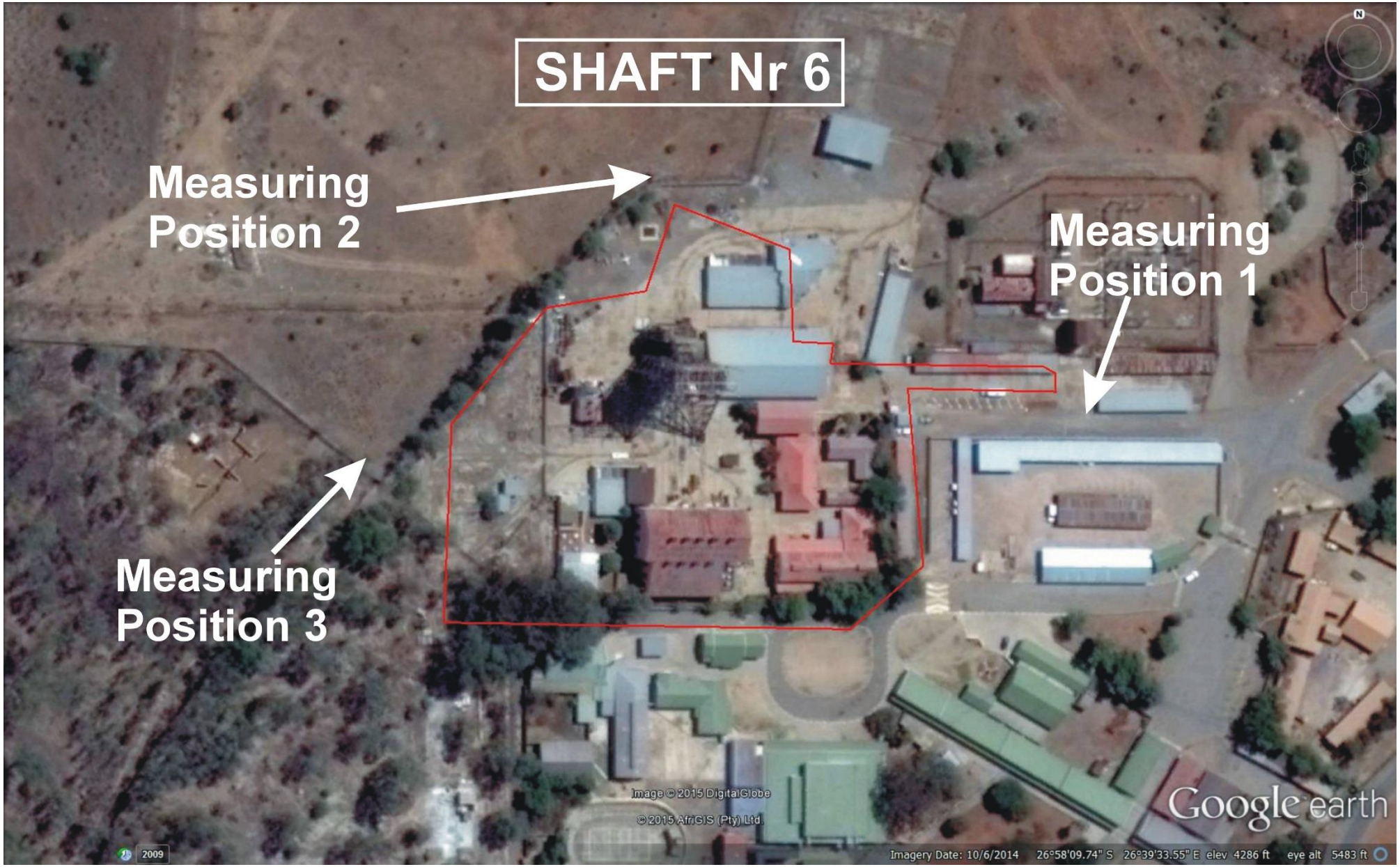


Figure 7: CAPM Orkney Gold Mine – Shaft Nr 6

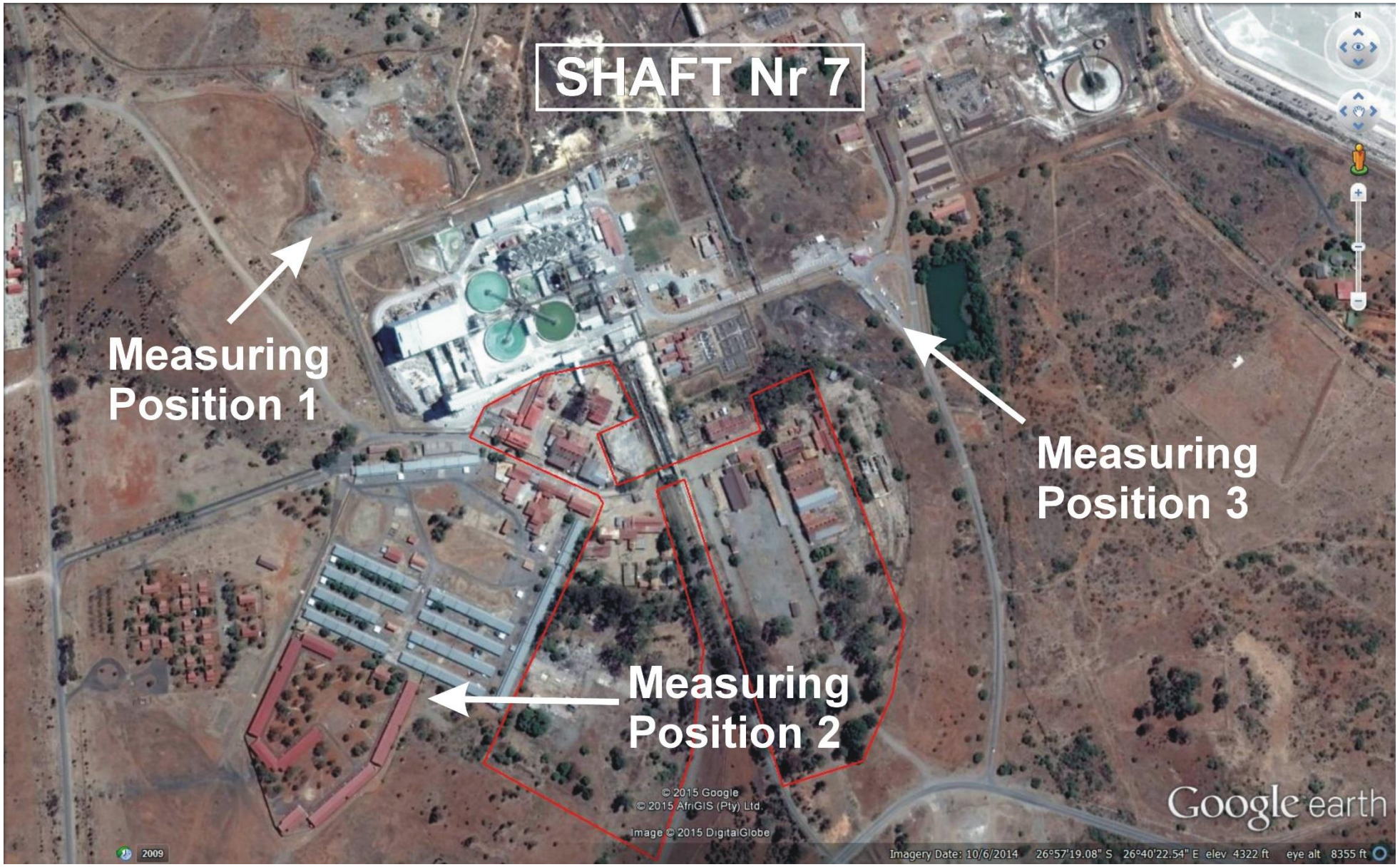


Figure 8: CAPM Orkney Gold Mine – Shaft Nr 7

sanas
Calibration Laboratory
148 1302

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Tel: 012 689 2007/8 • Fax: 086 211 4690
E-mail: calservice@mweb.co.za

CERTIFICATE OF CALIBRATION

CERTIFICATE NUMBER	2014-2208
ORGANISATION	VARICON CC
CALIBRATION OF	INTEGRATING SOUND LEVEL METER and ½" MICROPHONE
CALIBRATED BY	M. NAUDÉ
MANUFACTURERS	QUEST
MODEL NUMBERS	1900 and QE 4146
SERIAL NUMBERS	CC 5070013 and 17685
DATE OF CALIBRATION	19 NOVEMBER 2014
RECOMMENDED DUE DATE	NOVEMBER 2015
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 Naudé
M. NAUDÉ (SANAS TECHNICAL SIGNATORY)

23 November 2014
DATE OF ISSUE

Figure 9:- Calibration Certificate for Sound Level Meter

Chamber of Mines of South Africa

This is to certify that

CORNELIUS FRANCOIS MEYER

on 25TH SEPTEMBER, 1984

passed the prescribed examinations and has been awarded the

CERTIFICATE

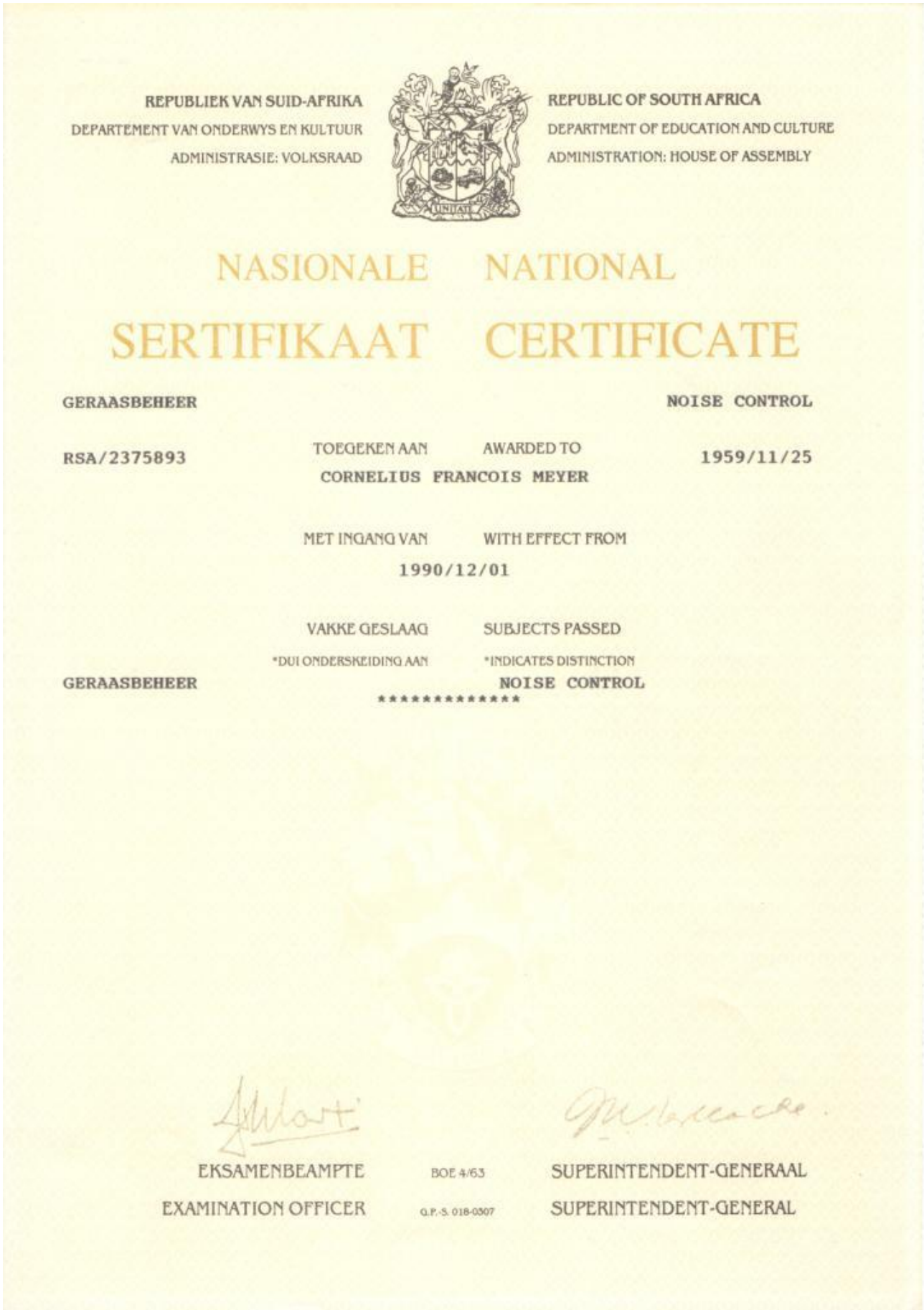
IN

MINE ENVIRONMENTAL CONTROL

General Manager

SERIAL No. 550

Figure 10:- Certificate in Mine Environmental Control



REPUBLIEK VAN SUID-AFRIKA
DEPARTEMENT VAN ONDERWYS EN KULTUUR
ADMINISTRASIE: VOLKSRAAD

REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF EDUCATION AND CULTURE
ADMINISTRATION: HOUSE OF ASSEMBLY

NASIONALE NATIONAL

SERTIFIKAAT CERTIFICATE

GERAASBEHEER — NOISE CONTROL

RSA/2375893 — TOEGEKEN AAN / AWARDED TO — 1959/11/25

CORNELIUS FRANCOIS MEYER

MET INGANG VAN / WITH EFFECT FROM

1990/12/01

VAKKE GESLAAG / SUBJECTS PASSED

*DUI ONDERSKEIDING AAN / *INDICATES DISTINCTION

GERAASBEHEER — NOISE CONTROL

****

EKSAMENBEAMPTE — EXAMINATION OFFICER

SUPERINTENDENT-GENERAAL — SUPERINTENDENT-GENERAL

BOE 4/63
G.P.-S. 018-0307

Figure 11:- National Certificate in Noise Control