Eskom	Work Instruction	Kusile Power Station

Title: **Kusile Power Station - Coal and Limestone Sampling Scope of Work**

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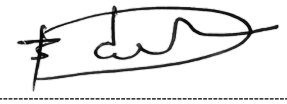	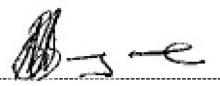	
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1. Introduction

Kusile Power Station intends to partner with an external contractor to provide services for coal and limestone sampling for a period of 5 years on an “as and when required” basis. Kusile Power Station receives coal and limestone from various sources. The coal and limestone are pre-certified at the sources, prior to delivering to the station. The coal delivered is either stored at the stockyard in the form of a live pile or a strategic stockpile. Kusile Power Station conducts its own verification of coal and limestone qualities to ensure coal and limestone is indeed of suitable quality.

2. Supporting Clauses

2.1 Scope

This scope covers the processes and the requirements for executing the work needed to ensure proper sampling is conducted onsite and it complies with coal sampling standards.

2.1.1 Purpose

The purpose of this document is to describe and list the requirements for coal and limestone sampling.

2.1.2 Applicability

This document shall apply throughout Kusile Power Station.

2.1.3 Effective Date

This document is effective from authorisation date.

2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

[1] ISO 9001:2015 Quality Management Systems

[2] Hard coal and coke – Manual sampling, Edition 1, Standards South Africa, SANS 18283:2007 (ISO 18283:2006), August 2007.

[3] Hard coal and coke – Mechanical sampling – Part 2: Coal – Sampling from moving streams Edition 1, Standards South Africa, SANS 13909-2:2002 (ISO 13909-2:2001), March 2012.

[4] Hard coal and coke – Mechanical sampling – Part 4: Coal – Preparation of test samples, Edition 1, Standards South Africa, SANS 13909-4:2002 (ISO 13909-4:2001), March 2012.

[5] Hard coal and coke – Mechanical sampling Part – Methods of testing for bias ISO 13909-8:2001

2.2.2 Informative

[1] Safety Health and Environment Specifications for Contractors - GVLIR 0007

[2] Construction, Safety, Health and Environment Management in Eskom - 32/136 Rev 0 -

[3] Eskom Information Security Policy - 32-85 Rev 0

[4] Eskom Vehicle and Driver Safety Management Procedure - 32-93 Rev 0

[5] Integrated Business improvement – prevention and improvement Standard - 6-366 Rev 0

[6] Smoking Policy - 32-36 Rev 0

[7] Alcohol Policy GGP 1209

[8] Incident Management 32-95

[9] Mandatory SHE requirements for the Eskom procurement and Supply chain management process - 32-726 Rev 0

2.3 Abbreviations

Abbreviation	Explanation
PPE	Personal Protective Equipment
FEL	Front End Loader
QC	Quality Controller
PS	Power Station
PED	Primary Energy Division
CSY	Coal Stock Yard
LAR	Limited Access Register
CQMP	Coal Quality Management Procedure
SOP	Standard Operating Procedure

3. User Requirements

3.1 Project Description

Coal and limestone sampling at Kusile Power Station for a period of 5 years on an “as and when required” basis. Refer to the scope in Appendix A.

3.2 Coal Verification Sampling

A representative sample is where every particle in a lot being sampled is equally represented. The basic purpose of collecting and preparing a sample of coal is to provide a test sample which when analysed will provide the test results representative of the lot sampled. There are International Standards for executing the job of representative sampling pertaining to different methods of sampling. However, due to time, technical and other economic constraints strict implementations of the procedures are difficult to practice for routine monitoring job. It is a known fact that about 80% of the total variances involved at the different stages of sample collection, preparation and analysis come from errors during its collection only. The important issue that is not always considered is the

effect of modified procedures on the precision of the result. This often leads to different controversies between the seller and the customer.

The following issues are to be considered:

a) Variability of coal
b) Number of samples from a lot
c) Number of increments comprising each sample
d) Mass of sample relative to the nominal top size

3.3 Stockpile Reclaim and Sampling

Sampling can be carried out during building or reclaiming a stockpile when loading or unloading, using the appropriate sampling equipment i.e., auto-mechanical samplers, ideally after mixing the truck load of coal considering that the different size fractions would have segregated during transport. Alternatively, a compromise may be made to perform manual scoop sampling (e.g., scoop that shall be 3 times the nominal top size of the coal). Pre-certified stockpile results at source versus verification stockpile results at power station / delivery point.

A representative sample is collected by taking a definitive number of portions, known as increments, periodically throughout the entire coal lot being sampled. The number and weight of increments required for a desired degree of precision depends on the variability of the coal. The variability increases with increasing impurities. It is imperative that the minimum specified weight and the minimum specified number of increments are not reduced.

3.4 Activity Pre-start

a) Risk assessment shall be conducted and by contracted sampling supervisor before conducting any activity on site.
b) Pre Job brief shall be conducted by the sampling supervisor onsite.
c) All samplers shall ensure that the correct PPE is worn (e.g., Hard hat, Safety glasses, Ear plugs, Overall, Gloves, Reflective vest/ Jacket, Dust Mask and Safety boots, Gumboots)
d) Report any deviations to the relevant supervisor.
e) Ensure that relevant PS inductions are done prior to performing any task at the Power Stations CSYs
f) Ensure that LAR is signed at the OPCR before performing any task at the CSY (if applicable)
g) Samplers shall be trained and deemed competent in carrying out the task.
h) Sampling Supervisor shall inspect the sampling equipment, e.g. sample bags, cable ties, sample tags, permanent marker etc.
i) Sampling Supervisor shall ensure that there are sufficient resources for sampling as per agreed scope of work.

3.5 Equipment

a) Sampling Scoop- The scoop dimensions shall be three times the nominal top size of the coal being sampled. In this exercise 150mm shall be used, this covers the maximum dimension of the scoop for coal of NTS less or equals to 50mm (this includes NTS of 30mm, 40mm and 50mm). Each sampling scoop taken shall only be a maximum of 75% of scoop capacity (three quarters full).
b) Refer to figure 1 below as an example of the scoop to be used.

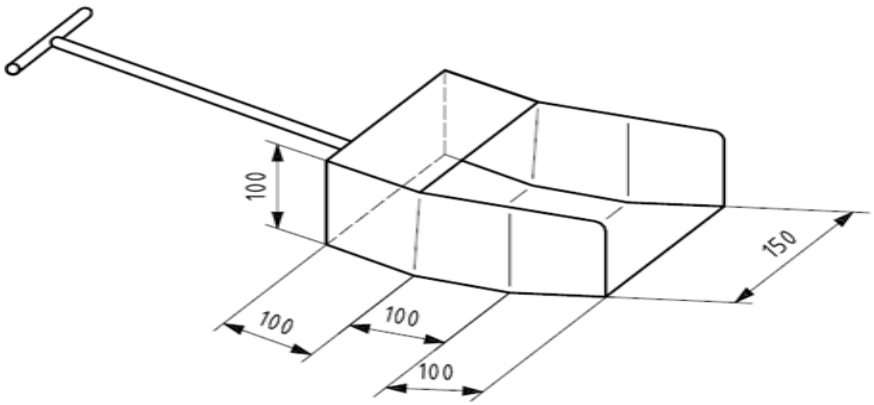

Figure 1: Scoop drawing

a) 50 kg Durable Plastic bags
b) Sample tags
c) Cable Ties
d) Permanent Marker
e) Front End Loader (if applicable)

3.6 Sampling Methodology

3.6.1 Manual sampling from tipped coal by trucks

a) Manual sampling shall be conducted at the stockyard on the tipped off coal from trucks.
b) Sampling shall be conducted as per ISO 18283: 2022 and ISO 1988:1975, for manual sampling and a representative sample shall be extracted from the sub-lots.
c) Three scoops shall be taken from each bucket in a zig-zag formation as per figure 2 below.
d) Care should be taken not to overfill the sampling scoop. The scoop should only be filled up to 75%.

Sampling of the stockpile being delivered shall continue until the stockpile has been depleted at the source.

Sampling shall be carried throughout the day (24hours) or if the coal is being delivered.

All the sample bags shall then be collected and delivered to the nominated laboratory for analysis.

The sample in each sample bag shall be fully identifiable carrying the original identity as reflected on the weighbridge slip from the coal supplier. The sample bags shall be identified with sample tags, each marked by means of waterproof ink with adequate identifying information, one tag being placed on the outside of the container, and one being placed inside the sample bag. The following shall be reflected on the waterproof sample tag. The unique identification as reflected on the weigh bill shall be as follows:

I. NBC S/P A 01/04/14,

Where:

a) NBC is abbreviation of the source e.g., Exxaro New Block Complex

b) S/P A01/04/14 is Stockpile followed by the date that the stockpile was created at the site.

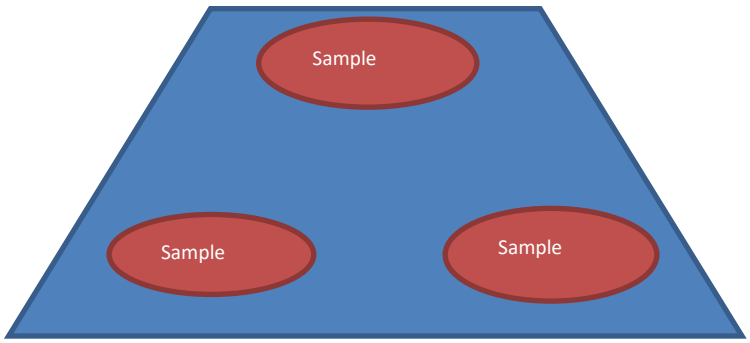

Figure 2: Sampling points in tipped off heap.

3.6.2 Manual sampling from the mobile feeders

a) Four samples are taken by 3 individuals.

b) - One person is responsible for noting down (using tags) the name/number of the MF that is being used on the day (randomly).

c) - Two of the three individuals are responsible for manually scooping and packaging 4 samples of approximately 20kg per bag (equivalent to 3 sampling scoops).

d) - Each sample is then tagged and sealed.

e) - Samples are then stored in a safe location awaiting pick up for Lab delivery.

3.6.3 Manual sampling on the gravitational feeders

a) At least three people are required for raw coal sampling.

b) Mill must be in service for the duration of sampling.

c) Sign the LAR at the unit control room.

d) Ensure that all the special tools are in the work area before commencing with sampling.

e) Ensure you are at the right unit and verify the KKS of the feeder.

f) Insert the sampling equipment into the sampling point with the sample slot facing upwards.

g) Push the sampling equipment until it touches the valve inside the sample point.

h) Open the valve fully and push the sampling equipment fully into the sample point.

i) Allow the sample slot to fill up for up to 5 seconds then pull out the sampling equipment with sampling slot facing upwards.

j) Close the valve after the sample equipment is fully out of the sample point.

k) Decant the sample content into the plastic bag and close the plastic bag.

l) Depending on the quantity of coal required repeat step d) to i).

m) Seal tight the plastic bag using the cable tie after sampling the required quantity of coal.

n) Label the sample tag with the following details: unit number, coal feeder number (KKS), date and time of sampling, Name of the sampling personnel. Attach the sample tag to the sample bag.

o) Sign off the LAR after task completion.

p) Take the samples to the laboratory.

3.6.4 Manual sampling on the gravitational feeder rejects.

a) Sampling on mill rejects will be required on an “as and when required basis”.

b) The sampling process of mill rejects is similar to the one mentioned in 3.6.3

3.6.5 Manual sampling on the limestone feeder conveyor

a) Two individuals are then responsible for scooping a 3 kg sample.

b) Ball Mill Weigh feeder sample: The sample point is opened using a panel key acquired at FGD control room upon completion of LAR/permit to work.

   i. The sample will be taken on the ball mill Limestone Weigh feeder belt 00HTK31/32/33CW001 inlet chute.

   ii. A sampling scoop is inserted into the running stream and when the scoop is filled (not overflowing), the sample is transferred into the sampling bag.

   iii. The sample will be taken 3 (three) times per interval of sampling (e,g., Left of belt, Middle of belt and right of belt).

   iv. A composite daily sample is thereafter made for incoming limestone into the mill.

c) Limestone stockyard conveyor sample: The sample can be taken at CVY1, CVY2 or CVY3 depending on which belt is being used to feed on the day upon completion of LAR/permit to work.

   i. The conveyor is allowed to run with product for 10 minutes.

   ii. The conveyor is stopped on the DCS by the controller in the FGD control room.

   iii. The SPO will activate the pull key to ensure that conveyor cannot be started during sampling.

   iv. A 1 (one) meter belt cut will be scooped and transferred into the sampling bag. The sample is obtained by marking 1 meter length along the conveyor where the sample will be extracted.

d) Sample is then tagged, noting down the time and date at which it was taken.

e) Each bag shall be weighed, and the weight recorded.

f) One 3kg sample per belt/ respective sample point.

g) Sample is then transported to the laboratory for analysis on the same day.

4. Acceptance

This document has been seen and accepted by:

Full Name and Surname	Designation
Evans Ramabina	Senior Chemist
Louisa Leshilo	Senior Technician
Bongumusa Bungane	Chemical Services Manager

5. Revisions

Date	Rev.	Compiler	Remarks
November 2024	3	Bongani Ndala	Sampling Contract due for renewal. Price list section added under appendix A. Title changed from work instruction to scope of work.
August 2020	2	Jabu Dhlamini	Kusile Coal and Limestone Sampling Work Instruction
June 2019	1	Letlhogonolo Tsoai	Kusile specific developed from Hendrina P/S Work Instruction

6. Development Team

- Louisa Leshilo – Senior Technician

7. Acknowledgements

- None

Appendix A – Eskom Document Hierarchy

ITEM	DESCRIPTION	HOURS	QTY	UNIT PRICE	MONTLY COST	YEAR 1	TOTAL COST
A	**Preliminaries and General (For site manager)**						
	Site Establishment		1				
	Site De-establishment		1				
	Safety file		1				
	Medicals & Induction Costs		29				
	PPE		29				
	Training		29				
	Consumables		1				
	Sub Total A						
B	**Coal and Limestone Samplers**	**HOURS**	**QTY**				
	Site Manager (Monday to Friday)	160	1				
	Site Supervisor (Monday to Sunday)	173	4				
	Site Supervisor (overtime)	60	4				
	Sampling per operator per hour (Monday to Sunday)	173	24				
	Sampling per operator per hour (Overtime)	60	24				
	Truck for sample transportation (8 Ton)		1				
	Samples Transport per km	219000	1				
	Employees Transport (Shift transport)		6 people per shift				
	TOTAL						

Appendix B – Health and Safety Regulations

The Contractor and his subcontractors shall always comply with safety regulations imposed by any Act of Parliament, ordinance or any regulation or by-law of any local or statutory authority. Specifically, the Contractor shall comply with:

The Occupational Health and Safety Act, 1993, and all Regulations made there under

All Eskom Safety and Operating Procedures including:

Construction Safety 32-136

Cardinal Rules 32-421

Driver Safety 32-93

Vehicle Safety 32-345

Incident Management 32-95

Alcohol Policy GGP 1209

Smoke Policy 32-36

Eskom Safety Principles:

No operating condition, or urgency of service, can justify endangering the life of anyone or cause injury.

Conduct business with respect and care for people and the environment and, ensure that adequate resources are available for SHE management.

All employees and Contractors are responsible for their own and that of their colleague's safety.

The Contractor commits to employ only people who have been duly authorized in terms thereof and who have received sufficient training to ensure that they can comply therewith.

No extension of time will be allowed as a result of any action taken by the Employer in terms of the above and the Contractor shall have no claim against the Employer as a result thereof. Furthermore, no amendments to the Act or Regulations or reasonable amendment to Eskom's Safety and Operating Procedures will entitle the Contractor to claim any additional costs incurred in complying therewith from Eskom.