

# COAL CONCEPTS PROFICIENCY TESTING

## GENERAL ANALYSIS SAMPLE

### REPORT – ONE HUNDRED AND ELEVEN

Revision 00

## Final report

DATE ISSUED: 31 JANUARY 2021

#### PARTICIPANT

**LABORATORY CODE:**

SCHEME COORDINATOR: K MUNSAMY



SIGNATURE

CHECKED BY: R BABOOLAL (SCHEME MANAGER)

*Disclaimer: Opinions and interpretations expressed herein are outside the scope of SANAS accreditation  
\*Moisture in the analysis sample is not included in the SANAS schedule of accreditation as robust statistics cannot be applied.  
Chlorine, Fluorine, Quick ash, ASTM ash and ASTM Volatiles is not included in the scope of accreditation.*

**THINKING QUALITY, QUALITY THINKING**

REGISTRATION NUMBER: 2006/149731/23 (RMB INDUSTRIAL STATIONERS cc t/a)

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**EXECUTIVE SUMMARY**

1. One hundred five samples were sent to participants with 102 timeous result submissions
2. The total number of outliers found were as follows (dry base):
  - ISO volatile matter x 3
  - Quick Ash x 1
  - ISO Ash x 2
  - Calorific value x 8
  - Sulphur x 2
  - Phosphorous x 1
  - Carbon x 2
  - Hydrogen x 1
  - AFT (Def) x 1
3. Chlorine, Fluorine, ASTM Ash, ASTM Volatile Matter participants were insufficient to warrant robust statistical calculations.
4. Trending for your laboratory is as follows:

### TABLE OF CONTENTS

ITEM	PAGE NUMBER
Letter to participant	4
List of participants	5
Type of sample used	6
Preparation of sample	6
Homogeneity check	6
Stability check	7
ISO Ash data	8
ISO Ash z-score trend	9
Quick Ash data	10
Quick Ash trend	11
ISO Volatile matter data	12
ISO Volatile matter z-score trend	13
Calorific value data	14
Calorific value z-score trend	15
Total sulphur data	16
Total sulphur z-score trend	17
Phosphorous data and Z-Score trend	18
Carbon data / Hydrogen data / Nitrogen data	19
AFT data and z-scores	20
ASTM Ash and ASTM Volatile matter and Chlorine & Fluorine and	21
Conclusion	22
Terms & Conditions	23

Dear Participant

**RE: PROFICIENCY TESTING RESULTS FOR THE MONTH OF JANUARY 2021**

Thank you for your participation in the Coal Concepts proficiency testing scheme.

Your laboratory code is as per the cover page.

All results are totally confidential. Any results in ***Bold, Italics and Underlined*** are outliers. Where applicable, the most extreme outliers have been eliminated from calculations using the Grubbs estimate for outliers. Robust statistics has been applied where possible. Analysis results have been reported on air dry and dry base. The dry base results have been used to calculate the z-scores.

Please take note of the following:

1. Z-scores between -1 and +1 is deemed acceptable
2. Z-scores between -2 and -3 should serve as a warning that the analysis result could get worse
3. Z-scores between +2 and +3 should also serve as a warning that analysis results could get worse.
4. Z- scores lower than -3 and exceeding +3 should warrant an investigation
5. Compare your result to the robust average which will be the assigned value. The measurement of uncertainty (UoM) of the results is also stated.
6. Z-Score calculations can be made available upon request

The Coal Concepts scheme adheres to the requirements of ISO/IEC 17043:2010 – Conformity assessment – General requirements for proficiency testing.

Statistical analysis has been carried out using ISO/IEC 13528:2015-Statistical methods for use in proficiency testing by interlaboratory comparisons

Please find results attached together with Z-score trends.

Best Regards

R Baboolal

## LIST OF PARTICIPANTS IN ALPHABETICAL ORDER

Arcelor Mittal - Vanderbijl Park	Arcelor Mittal - Newcastle
Anglo SOC - Goedehoop Colliery South Plant	Anglo SOC - Goedehoop Colliery North Plant
Anglo SOC - Kleinkopje Colliery	Anglo SOC - Greenside Colliery
Afrisam - Dudfield	Alfred H Knight -Richards Bay Laboratory
Afrisam - Ulco	AquaSpecto
Botswana Power Corporation - Morupule B Power Station	Botswana Power Corporation - Morupule A Power Station
Bureau Veritas Inspectorate Laboratories - Belfast	Bureau Veritas Inspectorate Laboratories - Middelburg
Bureau Veritas – Moatize, Vale	Bureau Veritas - Nacala
Bureau Veritas Inspectorate Laboratories - Tendele	Bureau Veritas Inspectorate Laboratories - Beira
Bureau Veritas Inspectorate Laboratories - Alton	Bureau Veritas Testing & Inspection SA - Pretoria
Castle Peak – Hong Kong	
Cotecna South Africa – Richards Bay	Cotecna South Africa - Nasonti
Cotecna South Africa - Lurco	Cotecna South Africa - Phola
Cotecna South Africa – Tselentis	Cotecna South Africa - Kangala
Cotecna South Africa - Middelburg	Cotecna Ubumbene(Pty)Ltd - Umlabu
Cotecna South Africa - Mimosa	Cotecna South Africa - AMR
Cotecna South Africa - Droogvallei	
Eyethu Coal Wilge	Eskom Holdings SOC Ltd - Matimba Power Station
Eskom Holdings SOC Ltd – Kendal Power station	Eskom Holdings SOC Ltd - Duvha Power Station
Eskom Holdings SOC Ltd – Lethabo Power Station	Eskom Holdings SOC Ltd - Komati Power Station
Eskom Holdings SOC Ltd - Tutuka Power Station	Eskom Holdings SOC Ltd - Grootvlei Power Station
Eskom Holdings SOC Ltd - ERID	Eskom Holdings SOC Ltd - Kriel Power Station
Eskom Holdings SOC Ltd - Hendrina Power Station	Eskom Holdings SOC Ltd – Majuba Power Station
Eskom Holdings SOC Ltd - Arnot Power Station	Exxaro Resources - Grootegeluk Mine
Eskom Holdings SOC Ltd - Matla Power Station	Eskom Holdings SOC Ltd – Medupi Power Station
Exxaro Resources - Matla Mine	G&W Base & Industrial Minerals
Glencore Wonderkop	Glencore -Rustenburg Smelter
Glencore Boshhoek Smelter	Glencore Lion Smelter
HighVeld Laboratories	Hwange Colliery – Zimbabwe
Idwala Lime	Jindal Mining SA Pty Ltd – Kiepersol Colliery
Kangra Coal (Pty) Ltd	Khwezela Colliery - Landau
Lafarge Industries SA (Pty) Ltd - Lichtenburg	Leon Inspection and Testing - Pakistan
Mpumamanzi Group CC	Mafube Colliery Mine PTY (Ltd)
Morupule Coal Mine - Botswana	Mitra SK South Africa (PTY) Ltd
Msobo Coal PTY Ltd	M L Coal PTY Ltd
Nelson Mandela University - Innoventon	Noko Analytical Services CC - Twistdraai
Noko Analytical Services CC - Witbank	Noko Analytical Services CC - Welgemeend
Quality Ensure Eastside Laboratory	Richards Bay Minerals
Ronewa Lab Middelburg	Ronewa Lab Ubuntu
RSA Labs - Phalandwa	RSA Labs - Khanye
SB Mining Solutions	Seriti - Kriel Colliery
Seriti - New Vaal Colliery	Siza Coal Services - Kinross
Siza Coal Services - Vlakfontein	Siza Coal Services - Umlalazi
Siza Coal Services - Wescoal	Siza Coal Services - Mooiplaats
Siza Coal Services - Botswana	Siza Coal Services - Sasolburg
Siza Coal Services - Middelburg	Siza Coal Services - NBC
Siza Coal Services - Carolina	Siza Coal Services - Wildfontein
Sibonisiwe Coal Laboratory Services CC – Clewer	South 32 – Khutala Colliery
Sibonisiwe Coal Laboratory Services CC Rietvlei Mining	Sibonisiwe Coal Laboratory Services CC Middelburg
Sibonisiwe Coal Laboratory Services CC - West Coal	Sibonisiwe Coal Laboratory Services CC – Mzimkhulu
SABS Commercial SOC Ltd Richards bay	SABS Commercial SOC Ltd NewCastle
SABS Commercial SOC Ltd CSIR	SABS Commercial SOC Ltd Secunda
SABS Commercial SOC Ltd Uitkomst	SPTe Lab - Middelburg
Tata Steel – Wales Lab, Europe	Universal Geominerals Sdn Bhd - Malaysia
Umzamo Analytical Services - Overlooked Colliery	Umzamo Analytical Services - Witbank
Umzamo Analytical Services - Sudor	Umzamo Analytical Services - VDD
Vitrovian Analytical Services DELMAS	Yıldız Lab. Test An. Ar. ve Dan. Hiz. Tic. Ltd. Şti. - Turkey

### 1. TYPE OF SAMPLE USED

The coal used in this proficiency testing round was bituminous coal .

### 2. PREPARATION OF SAMPLE

Approximately 1000kg's of coal with an approximate topsize of 50mm was sourced. This was crushed to -4mm using a jaw crusher. The -4mm material was reduced to -212um using a cross beat pulveriser. The 212 material was sieved using a 212um screen. Any +212um material was pulverised and sieved until all material passed through the 212 um sieve.

All the -212um material was then mixed in a mixing drum for 4 hours.

### 3. HOMOGENEITY CHECK

There were 105 participants in this round, 10 portions of sample were randomly extracted. These were packaged in their final form i.e. in 200ml sample bottles. The bottles were labelled 1 to 10. The results were as follows:

SAMPLE NO.	TEST PORTION 1	TEST PORTION 2	sample av (Xt)	range (Wt)	range sqd
1	17.85	17.96	17.91	0.11	0.0121
2	17.85	18.00	17.93	0.15	0.0225
3	17.95	18.07	18.01	0.12	0.0144
4	17.92	18.14	18.03	0.22	0.0484
5	17.96	18.08	18.02	0.12	0.0144
6	17.77	18.17	17.97	0.40	0.1600
7	18.03	18.01	18.02	0.02	0.0004
8	17.96	18.00	17.98	0.04	0.0016
9	18.01	18.00	18.01	0.01	0.0001
10	18.06	18.07	18.07	0.01	0.0001
GENERAL AVERAGE			17.99		
STANDARD DEVIATION			0.049		
WITHIN SAMPLE STANDARD DEVIATION			0.117		
BETWEEN SAMPLE STANDARD DEVIATION			0.067		

The between sample standard deviation must be  $\leq 0.3 \times \sigma$

( $\sigma$  = std deviation for the proficiency assessment)

$\sigma$  = 2% of the mean was used, which is the repeatability for ISO ash (Ash % > 10%)

Hence  $0.3 \times 0.360 = 0.108$

**Since 0.067 < 0.108 , the samples are homogenous**

#### 4. STABILITY CHECK

Samples were retained for sales as reference material. Ten of them were randomly chosen for stability testing. In order for the proficiency testing samples to be declared stable the general average from the homogeneity check and that of the stability check the difference in the general average should not differ by more than 0.3 X precision.

This test has been carried out about a month after the samples were received by the participating laboratories

SAMPLE NO.	TEST PORTION 1	TEST PORTION 2	sample av (Xt)	range (Wt)	range sqd
1	17.94	17.91	17.93	0.03	0.0009
2	18.04	17.93	17.99	0.11	0.0121
3	18.02	17.94	17.98	0.08	0.0064
4	17.76	17.93	17.85	0.17	0.0289
5	17.82	17.94	17.88	0.12	0.0144
6	17.90	17.86	17.88	0.04	0.0016
7	17.86	17.98	17.92	0.12	0.0144
8	17.90	17.94	17.92	0.04	0.0016
9	17.93	17.92	17.93	0.01	0.0001
10	17.88	17.96	17.92	0.08	0.0064
GENERAL AVERAGE			17.92		
STANDARD DEVIATION			0.043		
WITHIN SAMPLE STANDARD DEVIATION			0.066		
BETWEEN SAMPLE STANDARD DEVIATION			0.018		

( $\sigma = 0.108$  was used)

**For this report  $0.3 \times 0.360 = 0.102$**

**Absolute value of  $(17.92 - 17.99) = 0.090$**

**Since  $0.090 < 0.102$  the proficiency testing samples were stable**

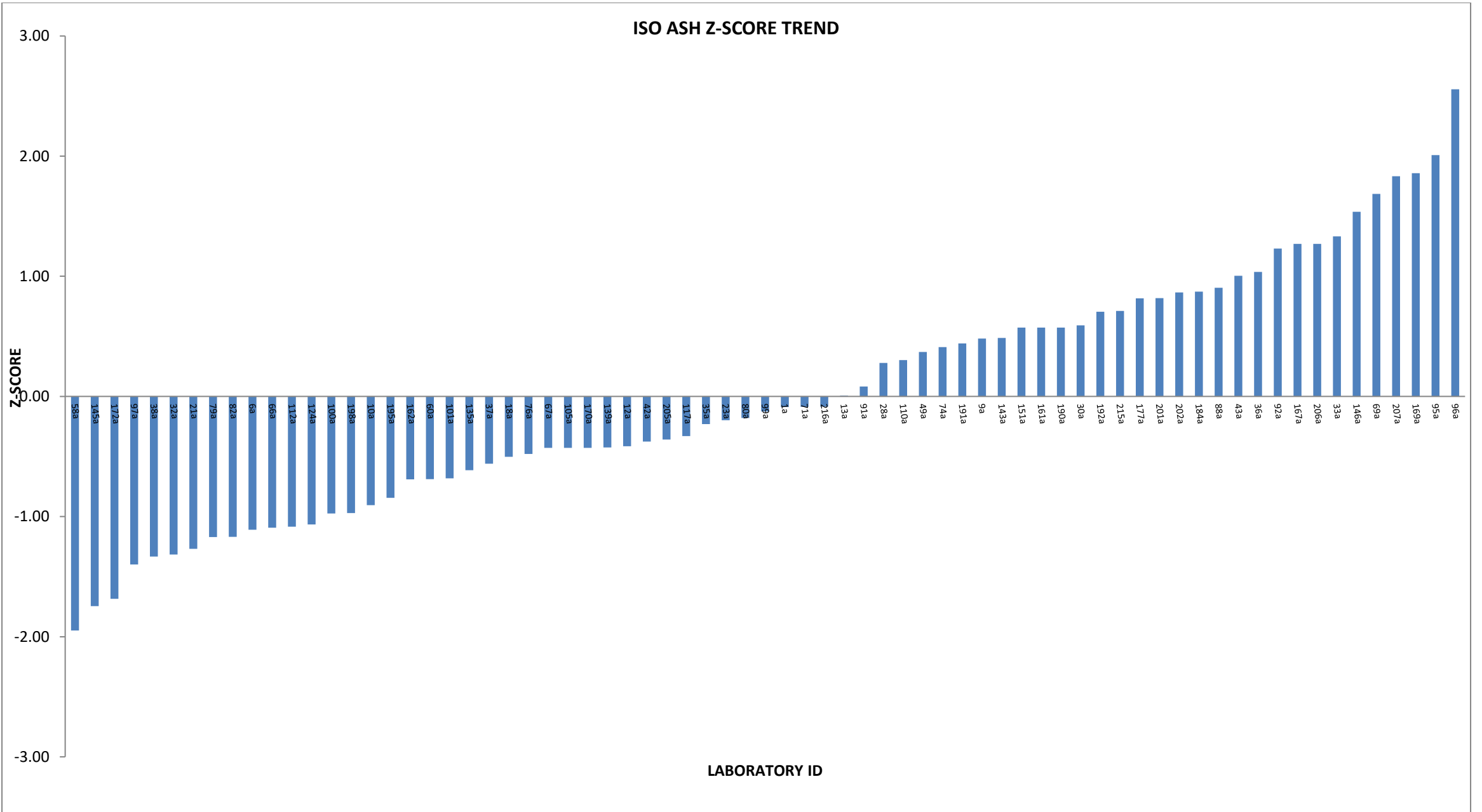
## COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021

## ANALYTICAL PARAMETER : ISO ASH (%)

LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY (%)	DRY BASE (%)	Z-SCORE (DRY BASE)
1a	5.44	17.86	18.89	-0.09
6a	4.98	17.80	18.73	-1.11
<b>7a</b>	3.36	<b>23.41</b>	<b>24.22</b>	<b>35.19</b>
9a	5.50	17.93	18.97	0.48
10a	5.19	17.79	18.76	-0.91
12a	5.67	17.77	18.84	-0.41
13a	5.30	17.90	18.90	0.0
18a	4.54	17.97	18.82	-0.50
21a	4.43	17.88	18.71	-1.27
23a	5.25	17.88	18.87	-0.20
28a	4.45	18.10	18.94	0.28
30a	4.74	18.09	18.99	0.59
32a	4.50	17.86	18.70	-1.32
33a	4.20	18.30	19.10	1.33
35a	4.59	18.00	18.87	-0.23
36a	4.50	18.20	19.06	1.04
37a	5.40	17.80	18.82	-0.56
38a	5.45	17.68	18.70	-1.33
42a	4.85	17.93	18.84	-0.38
43a	5.00	18.10	19.05	1.00
49a	4.73	18.06	18.96	0.37
58a	5.30	17.62	18.61	-1.95
60a	4.77	17.90	18.80	-0.69
66a	4.94	17.81	18.74	-1.09
67a	5.50	17.80	18.84	-0.43
69a	5.25	18.15	19.16	1.69
71a	4.70	18.00	18.89	-0.09
74a	4.55	18.10	18.96	0.41
76a	4.93	17.90	18.83	-0.48
79a	4.72	17.84	18.72	-1.17
80a	5.00	17.93	18.87	-0.18
82a	4.40	17.90	18.72	-1.17
88a	5.45	18.00	19.04	0.90
91a	4.30	18.10	18.91	0.08
92a	5.17	18.10	19.09	1.23
95a	5.70	18.11	19.20	2.01
96a	5.69	18.19	19.29	2.56
97a	4.33	17.88	18.69	-1.40
99a	5.20	17.90	18.88	-0.12
100a	4.71	17.87	18.75	-0.97
101a	5.36	17.79	18.80	-0.68
105a	5.50	17.80	18.84	-0.43
<b>106a</b>	5.13	<b>18.92</b>	<b>19.94</b>	<b>6.89</b>
110a	4.89	18.02	18.95	0.30
112a	5.00	17.80	18.74	-1.08
117a	5.15	17.88	18.85	-0.33
124a	4.96	17.81	18.74	-1.07
135a	5.04	17.86	18.81	-0.61
139a	5.29	17.84	18.84	-0.43
143a	5.24	17.98	18.97	0.49
145a	5.08	17.69	18.64	-1.75
146a	5.40	18.10	19.13	1.54
151a	5.20	18.00	18.99	0.57
161a	5.20	18.00	18.99	0.57
162a	5.30	17.80	18.80	-0.69
167a	5.20	18.10	19.09	1.27
169a	4.18	18.38	19.18	1.86
170a	4.81	17.93	18.84	-0.43
172a	5.18	17.68	18.65	-1.69
177a	4.28	18.21	19.02	0.82
184a	4.90	18.10	19.03	0.87
190a	5.20	18.00	18.99	0.57
191a	5.10	18.00	18.97	0.44
192a	5.30	18.00	19.01	0.70
195a	4.97	17.84	18.77	-0.84
198a	4.50	17.91	18.75	-0.97
201a	5.28	18.02	19.02	0.82
202a	5.21	18.04	19.03	0.86
206a	5.20	18.10	19.09	1.27
205a	5.50	17.81	18.85	-0.36
207a	5.10	18.20	19.18	1.83
215a	5.62	17.94	19.01	0.71
216a	3.43	18.24	18.89	-0.09
Number of results	-	<b>73</b>	<b>73</b>	-
OUTLIERS	-	<b>2</b>	<b>2</b>	-
AVERAGE	-	<b>4.97</b>	<b>17.96</b>	<b>18.90</b>
STD DEVIATION	-	-	<b>0.15</b>	<b>0.15</b>
MEDIAN	-	-	<b>17.93</b>	<b>18.88</b>
ROBUST AVERAGE	-	-	<b>17.95</b>	<b>18.90</b>
ROBUST STD DEVIATION	-	-	<b>0.17</b>	<b>0.17</b>
UoM	-	-	<b>0.02</b>	<b>0.02</b>



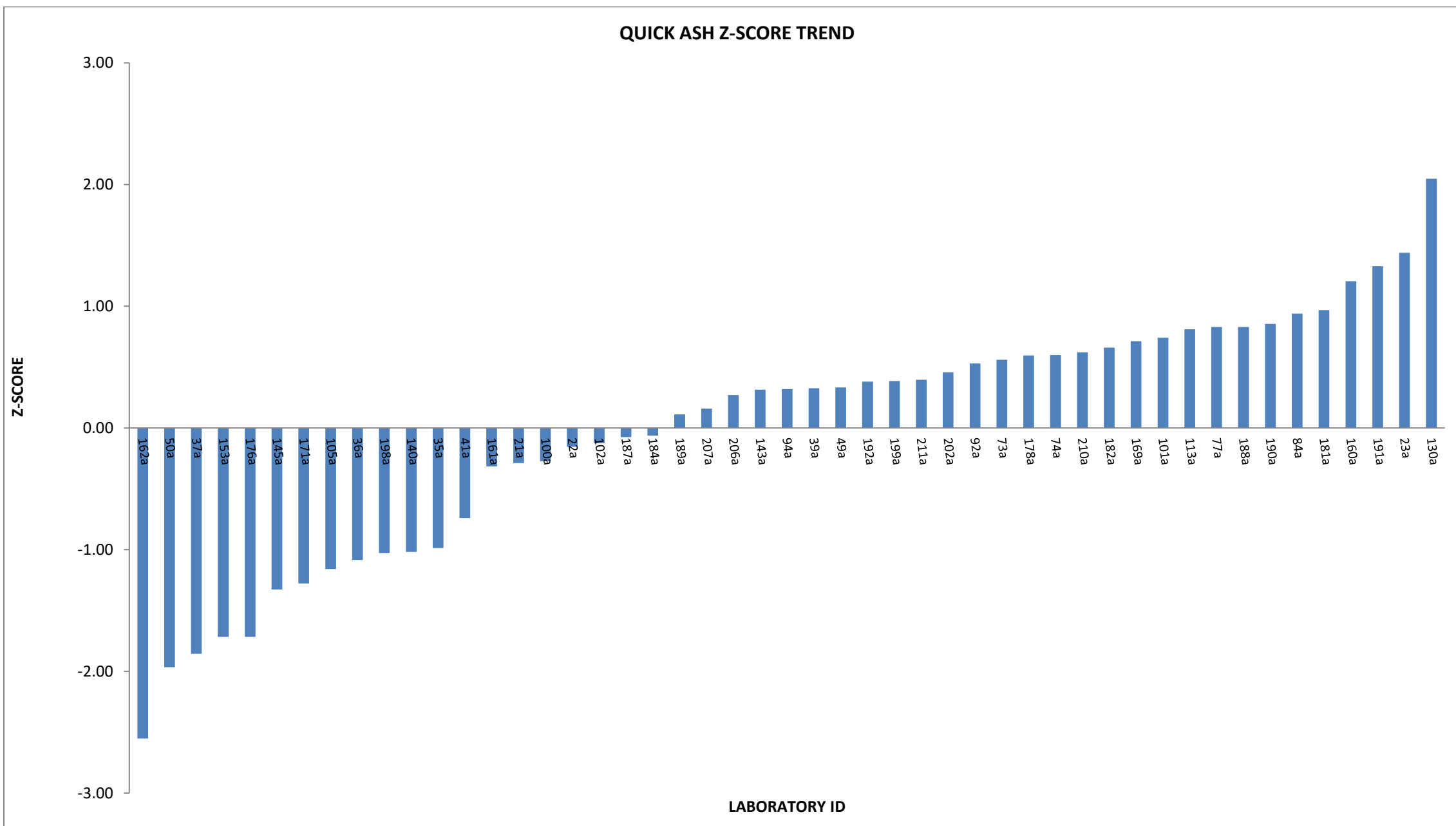
### ISO ASH Z-SCORE TREND



## COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021

## ANALYTICAL PARAMETER : QUICK ASH (%)

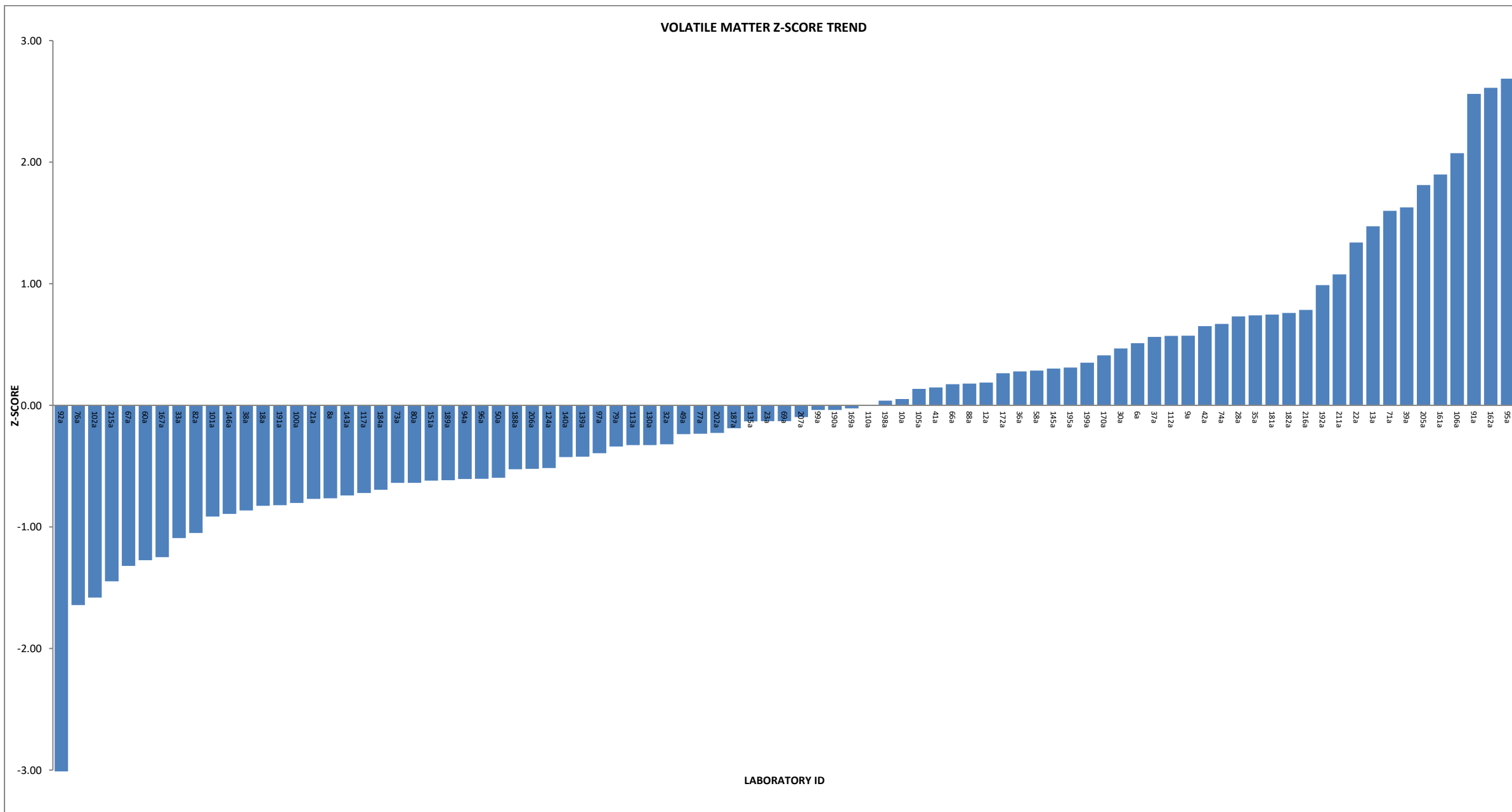
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY (%)	DRY BASE (%)	Z-SCORE (DRY BASE)
	<u>8a</u>	5.20	<u>9.10</u>	<u>9.60</u>	<u>-51.88</u>
	21a	4.43	18.05	18.89	-0.29
	22a	4.87	17.99	18.91	-0.15
	23a	5.25	18.19	19.20	1.44
	35a	4.59	17.90	18.76	-0.99
	36a	4.50	17.90	18.74	-1.08
	37a	5.40	17.60	18.60	-1.86
	39a	4.83	18.08	19.00	0.33
	41a	4.23	18.01	18.81	-0.74
	49a	4.73	18.10	19.00	0.33
	50a	5.03	17.65	18.58	-1.97
	73a	4.83	18.12	19.04	0.56
	74a	4.55	18.18	19.05	0.60
	77a	5.70	18.00	19.09	0.83
	84a	5.85	17.99	19.11	0.94
	92a	5.17	18.05	19.03	0.53
	94a	5.35	17.98	19.00	0.32
	100a	4.71	18.00	18.89	-0.27
	101a	5.36	18.05	19.07	0.74
	102a	5.90	17.80	18.92	-0.13
	105a	5.50	17.70	18.73	-1.16
	113a	5.37	18.06	19.08	0.81
	130a	4.70	18.40	19.31	2.05
	140a	4.40	17.93	18.76	-1.02
	143a	5.24	18.00	19.00	0.31
	145a	5.08	17.75	18.70	-1.33
	153a	4.99	17.70	18.63	-1.72
	160a	4.99	18.20	19.16	1.21
	161a	5.20	17.90	18.88	-0.32
	162a	5.30	17.50	18.48	-2.55
	169a	4.18	18.27	19.07	0.71
	171a	4.43	17.88	18.71	-1.28
	176a	4.99	17.70	18.63	-1.72
	178a	4.18	18.25	19.05	0.60
	181a	5.30	18.10	19.11	0.97
	182a	4.50	18.20	19.06	0.66
	184a	4.90	18.00	18.93	-0.06
	187a	4.73	18.03	18.93	-0.08
	188a	5.70	18.00	19.09	0.83
	189a	4.53	18.10	18.96	0.11
	190a	5.20	18.10	19.09	0.86
	191a	5.10	18.20	19.18	1.33
	192a	5.30	18.00	19.01	0.38
	198a	4.50	17.91	18.75	-1.03
	199a	5.41	17.98	19.01	0.39
	202a	5.21	18.03	19.02	0.46
	206a	5.20	18.00	18.99	0.27
	207a	5.10	18.00	18.97	0.16
	210a	4.99	18.10	19.05	0.62
	211a	4.63	18.13	19.01	0.40
<b>Number of results</b>	-	<b>50</b>	<b>50</b>	<b>50</b>	-
<b>OUTLIERS</b>	-	-	<b>1</b>	<b>1</b>	-
<b>AVERAGE</b>	-	<b>4.97</b>	<b>18.00</b>	<b>18.94</b>	-
<b>STD DEVIATION</b>	-	-	<b>0.18</b>	<b>0.18</b>	-
<b>MEDIAN</b>			<b>18.00</b>	<b>19.00</b>	
<b>ROBUST AVERAGE</b>	-	-	<b>18.00</b>	<b>18.94</b>	
<b>ROBUST STD DEVIATION</b>	-	-	<b>0.19</b>	<b>0.19</b>	
<b>UoM</b>			<b>0.03</b>	<b>0.03</b>	



## COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021

## ANALYTICAL PARAMETER : ISO VOLATILE MATTER (%)

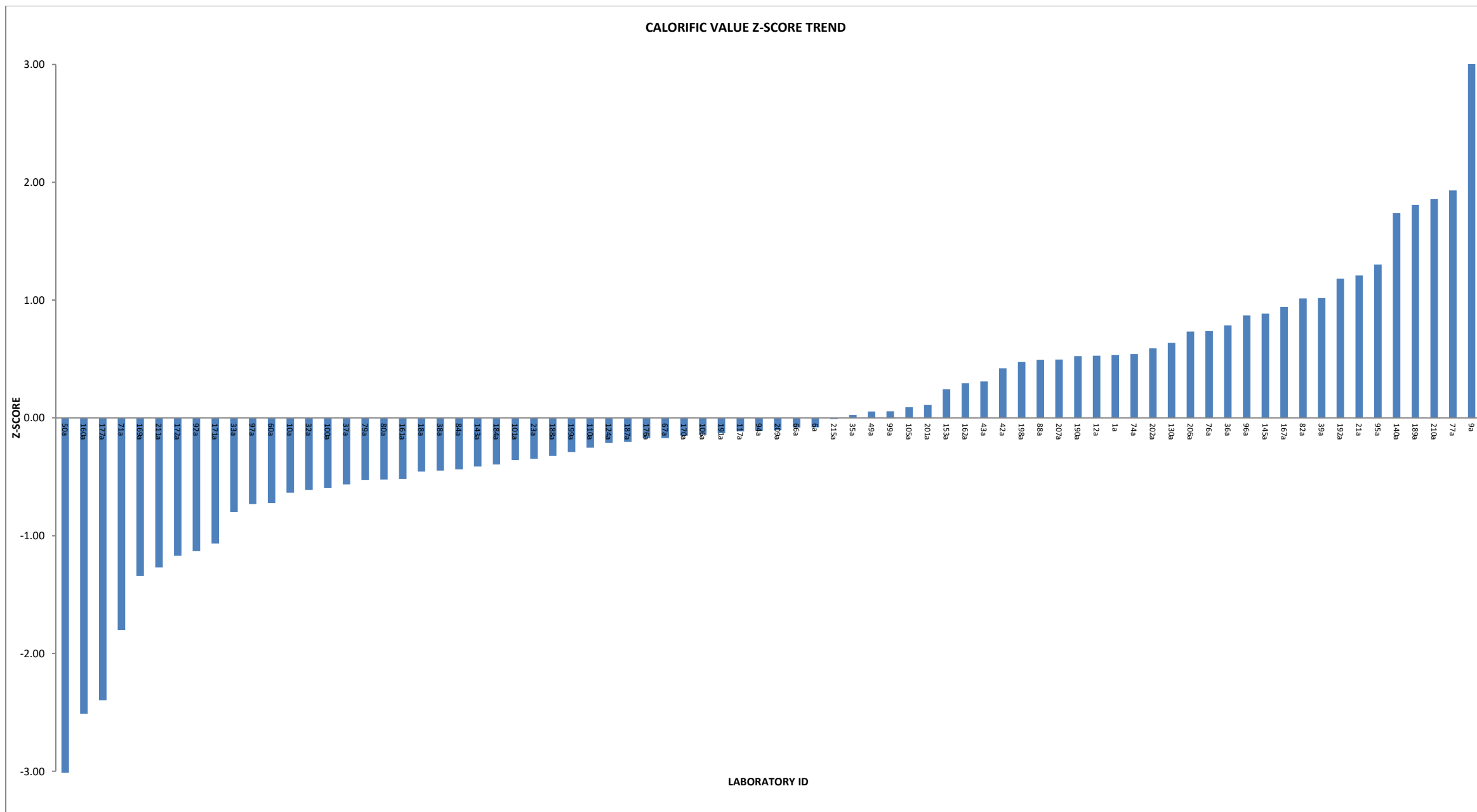
LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
6a	4.98	22.98	24.18	0.51
<b>7a</b>	3.36	<b>18.85</b>	<b>19.51</b>	<b>-10.23</b>
8a	5.20	22.40	23.63	-0.76
9a	5.50	22.88	24.21	0.57
10a	5.19	22.74	23.98	0.05
12a	5.67	22.68	24.04	0.19
13a	5.30	23.30	24.60	1.47
18a	4.54	22.53	23.60	-0.83
21a	4.43	22.58	23.63	-0.77
22a	4.87	23.35	24.55	1.34
23a	5.25	22.65	23.91	-0.13
28a	4.45	23.20	24.28	0.73
30a	4.74	23.02	24.17	0.47
32a	4.50	22.75	23.82	-0.32
33a	4.20	22.50	23.49	-1.09
35a	4.59	23.17	24.28	0.74
36a	4.50	23.00	24.08	0.28
37a	5.40	22.90	24.21	0.56
38a	5.45	22.30	23.59	-0.86
39a	4.83	23.48	24.67	1.63
41a	4.23	23.01	24.03	0.15
42a	4.85	23.07	24.25	0.65
<b>43a</b>	5.00	<b>27.06</b>	<b>28.48</b>	<b>10.38</b>
49a	4.73	22.73	23.86	-0.24
50a	5.03	22.51	23.70	-0.60
58a	5.30	22.81	24.09	0.29
60a	4.77	22.29	23.41	-1.27
66a	4.94	22.85	24.04	0.17
67a	5.50	22.10	23.39	-1.32
69a	5.25	22.65	23.91	-0.13
71a	4.70	23.50	24.66	1.60
73a	4.83	22.54	23.68	-0.64
74a	4.55	23.15	24.25	0.67
76a	4.93	22.10	23.25	-1.64
77a	5.70	22.50	23.86	-0.23
79a	4.72	22.69	23.81	-0.34
80a	5.00	22.50	23.68	-0.64
82a	4.40	22.47	23.50	-1.05
88a	5.45	22.73	24.04	0.18
91a	4.30	24.00	25.08	2.56
92a	5.17	21.38	22.55	-3.25
94a	5.35	22.43	23.70	-0.61
95a	5.70	23.70	25.13	2.69
96a	5.69	22.35	23.70	-0.60
97a	4.33	22.76	23.79	-0.39
99a	5.20	22.70	23.95	-0.04
100a	4.71	22.50	23.61	-0.80
101a	5.36	22.30	23.56	-0.92
102a	5.90	21.90	23.27	-1.58
105a	5.50	22.70	24.02	0.14
106a	5.13	23.59	24.87	2.07
110a	4.89	22.79	23.96	0.00
112a	5.00	23.00	24.21	0.57
113a	5.37	22.54	23.82	-0.33
117a	5.15	22.43	23.65	-0.72
124a	4.96	22.56	23.74	-0.52
130a	4.70	22.70	23.82	-0.33
135a	5.04	22.70	23.90	-0.13
139a	5.29	22.52	23.78	-0.42
140a	4.40	22.73	23.78	-0.43
143a	5.24	22.40	23.64	-0.74
145a	5.08	22.87	24.09	0.30
146a	5.40	22.30	23.57	-0.89
151a	5.20	22.46	23.69	-0.62
161a	5.20	23.50	24.79	1.90
162a	5.30	23.77	25.10	2.61
167a	5.20	22.20	23.42	-1.25
169a	4.18	22.95	23.95	-0.02
170a	4.81	22.98	24.14	0.41
172a	5.18	22.83	24.08	0.26
181a	5.30	23.00	24.29	0.75
182a	4.50	23.20	24.29	0.76
184a	4.90	22.50	23.66	-0.69
187a	4.73	22.75	23.88	-0.19
188a	5.70	22.38	23.73	-0.53
189a	4.53	22.62	23.69	-0.62
190a	5.20	22.70	23.95	-0.04
191a	5.10	22.40	23.60	-0.82
192a	5.30	23.10	24.39	0.99
195a	4.97	22.90	24.10	0.31
198a	4.50	22.90	23.98	0.04
199a	5.41	22.81	24.11	0.35
<b>201a</b>	5.28	<b>20.80</b>	<b>21.96</b>	<b>-4.60</b>
202a	5.21	22.62	23.86	-0.23
205a	5.50	23.39	24.75	1.81
206a	5.20	22.50	23.73	-0.52
207a	5.10	22.70	23.92	-0.10
211a	4.63	23.30	24.43	1.08
215a	5.62	22.02	23.33	-1.45
216a	3.43	23.47	24.30	0.78
NUMBER OF RESULTS	-	90	90	-
OUTLIERS	-	-	<b>3</b>	-
AVERAGE	-	<b>4.99</b>	<b>22.76</b>	<b>23.96</b>
STD DEVIATION	-	-	<b>0.43</b>	<b>0.44</b>
MEDIAN	-	-	<b>22.70</b>	<b>23.91</b>
ROBUST AVERAGE	-	-	<b>22.77</b>	<b>23.96</b>
ROBUST STD DEVIATION	-	-	<b>0.45</b>	<b>0.46</b>
UoM	-	-	<b>0.06</b>	<b>0.06</b>



## COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021

## ANALYTICAL PARAMETER : CALORIFIC VALUE (MJ/kg)

LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY (MJ/kg)	DRY BASE (MJ/kg)	Z-SCORE (DRY BASE)
1a	5.44	24.27	25.67	0.53
6a	4.98	24.27	25.54	-0.08
<b>8a</b>	5.20	<b>28.97</b>	<b>30.56</b>	<b>24.71</b>
9a	5.50	24.74	26.18	3.07
10a	5.19	24.11	25.43	-0.64
12a	5.67	24.21	25.67	0.53
18a	4.54	24.31	25.47	-0.46
21a	4.43	24.66	25.80	1.21
23a	5.25	24.15	25.49	-0.35
<b>28a</b>	4.45	<b>25.44</b>	<b>26.62</b>	<b>5.27</b>
<b>30a</b>	4.74	<b>25.82</b>	<b>27.10</b>	<b>7.64</b>
32a	4.50	24.29	25.43	-0.61
33a	4.20	24.33	25.40	-0.80
35a	4.59	24.39	25.56	0.0
36a	4.50	24.56	25.72	0.79
37a	5.40	24.07	25.44	-0.57
38a	5.45	24.08	25.47	-0.45
39a	4.83	24.52	25.76	1.02
42a	4.85	24.40	25.64	0.42
43a	5.00	24.34	25.62	0.31
49a	4.73	24.36	25.57	0.05
50a	5.03	23.66	24.91	-3.19
<b>58a</b>	5.30	<b>21.28</b>	<b>22.47</b>	<b>-15.26</b>
60a	4.77	24.20	25.41	-0.72
66a	4.94	24.28	25.54	-0.08
67a	5.50	24.12	25.52	-0.17
71a	4.70	24.01	25.19	-1.80
<b>73a</b>	4.83	<b>26.39</b>	<b>27.73</b>	<b>10.73</b>
74a	4.55	24.50	25.67	0.54
76a	4.93	24.44	25.71	0.74
77a	5.70	24.47	25.95	1.93
79a	4.72	24.25	25.45	-0.53
80a	5.00	24.18	25.45	-0.52
82a	4.40	24.63	25.76	1.01
84a	5.85	23.98	25.47	-0.44
88a	5.45	24.26	25.66	0.49
92a	5.17	24.02	25.33	-1.13
94a	5.35	24.17	25.54	-0.11
95a	5.70	24.35	25.82	1.30
96a	5.69	24.27	25.73	0.9
97a	4.33	24.31	25.41	-0.73
99a	5.20	24.24	25.57	0.06
100a	4.71	24.24	25.44	-0.59
101a	5.36	24.12	25.49	-0.36
<b>102a</b>	5.90	<b>26.30</b>	<b>27.95</b>	<b>11.81</b>
105a	5.50	24.17	25.58	0.09
106a	5.13	24.22	25.53	-0.14
110a	4.89	24.26	25.51	-0.25
117a	5.15	24.22	25.54	-0.12
124a	4.96	24.25	25.52	-0.21
130a	4.70	24.48	25.69	0.64
140a	4.40	24.77	25.91	1.74
143a	5.24	24.14	25.47	-0.41
145a	5.08	24.43	25.74	0.89
153a	4.99	24.33	25.61	0.24
160a	4.99	23.80	25.05	-2.51
161a	5.20	24.13	25.45	-0.52
162a	5.30	24.26	25.62	0.29
167a	5.20	24.41	25.75	0.94
169a	4.18	24.23	25.29	-1.34
170a	4.81	24.30	25.53	-0.15
171a	4.43	24.22	25.34	-1.07
172a	5.18	24.01	25.32	-1.17
176a	4.99	24.25	25.52	-0.17
177a	4.28	24.00	25.07	-2.40
<b>181a</b>	5.30	<b>25.75</b>	<b>27.19</b>	<b>8.07</b>
<b>182a</b>	4.50	<b>25.22</b>	<b>26.41</b>	<b>4.20</b>
184a	4.90	24.23	25.48	-0.39
187a	4.73	24.31	25.52	-0.20
188a	5.70	24.04	25.49	-0.32
189a	4.53	24.75	25.92	1.81
190a	5.20	24.33	25.66	0.52
191a	5.10	24.23	25.53	-0.13
192a	5.30	24.43	25.80	1.18
198a	4.50	24.50	25.65	0.47
199a	5.41	24.12	25.50	-0.29
201a	5.28	24.23	25.58	0.11
202a	5.21	24.34	25.68	0.59
206a	5.20	24.37	25.71	0.73
207a	5.10	24.35	25.66	0.50
209a	5.55	24.12	25.54	-0.10
210a	4.99	24.64	25.93	1.86
211a	4.63	24.13	25.30	-1.27
215a	5.62	24.12	25.56	0.0
<b>NUMBER OF RESULTS</b>	-	84	84	-
<b>OUTLIERS</b>	-	-	8	-
<b>AVERAGE</b>	-	5.01	24.27	25.56
<b>STD DEVIATION</b>	-	-	0.20	0.20
<b>MEDIAN</b>	-	-	24.26	25.54
<b>ROBUST AVERAGE</b>	-	-	24.28	25.56
<b>ROBUST STD DEVIATION</b>	-	-	0.21	0.21
<b>UoM</b>	-	-	0.03	0.03

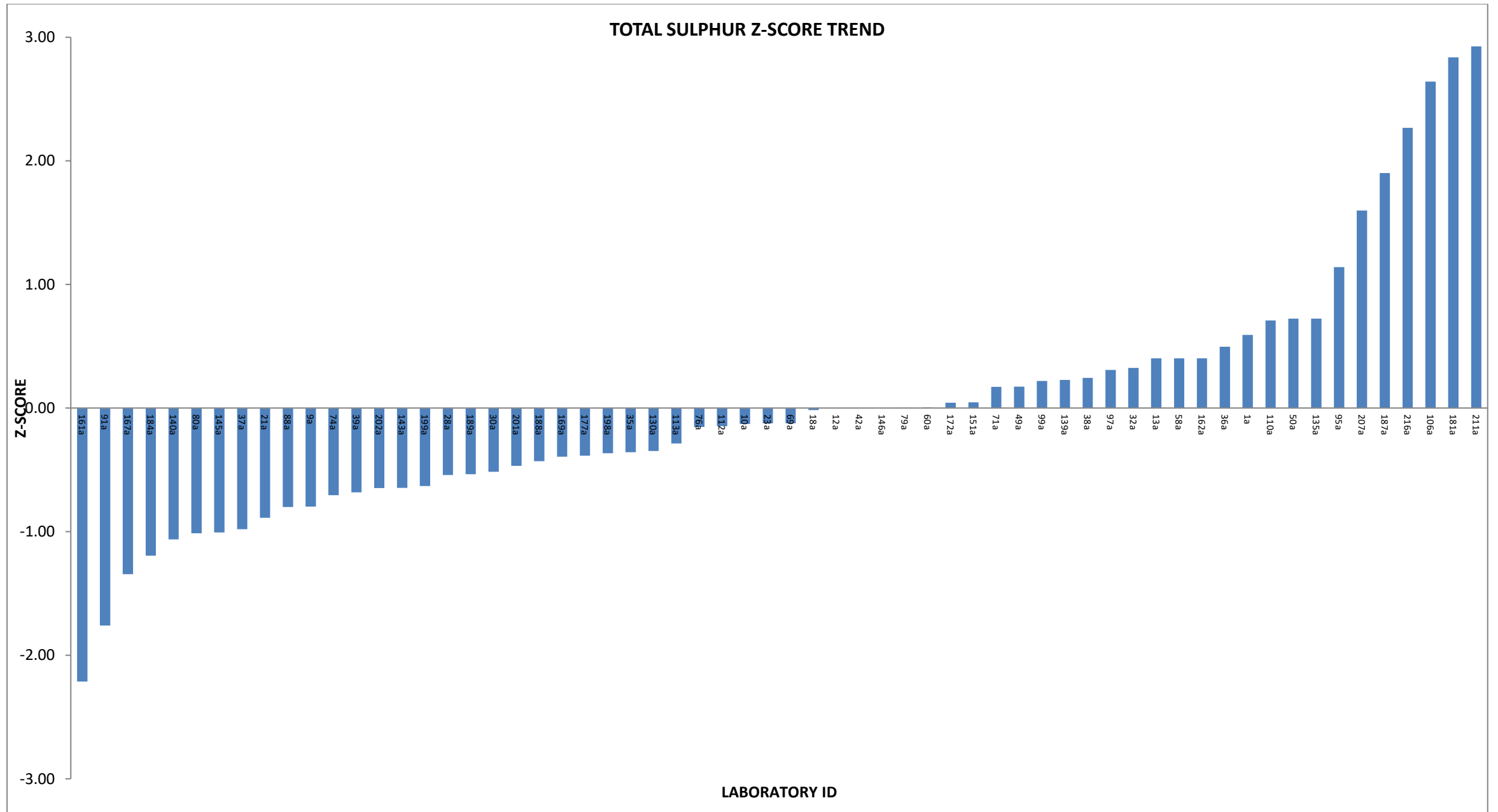


## COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021

## ANALYTICAL PARAMETER : TOTAL SULPHUR (%)

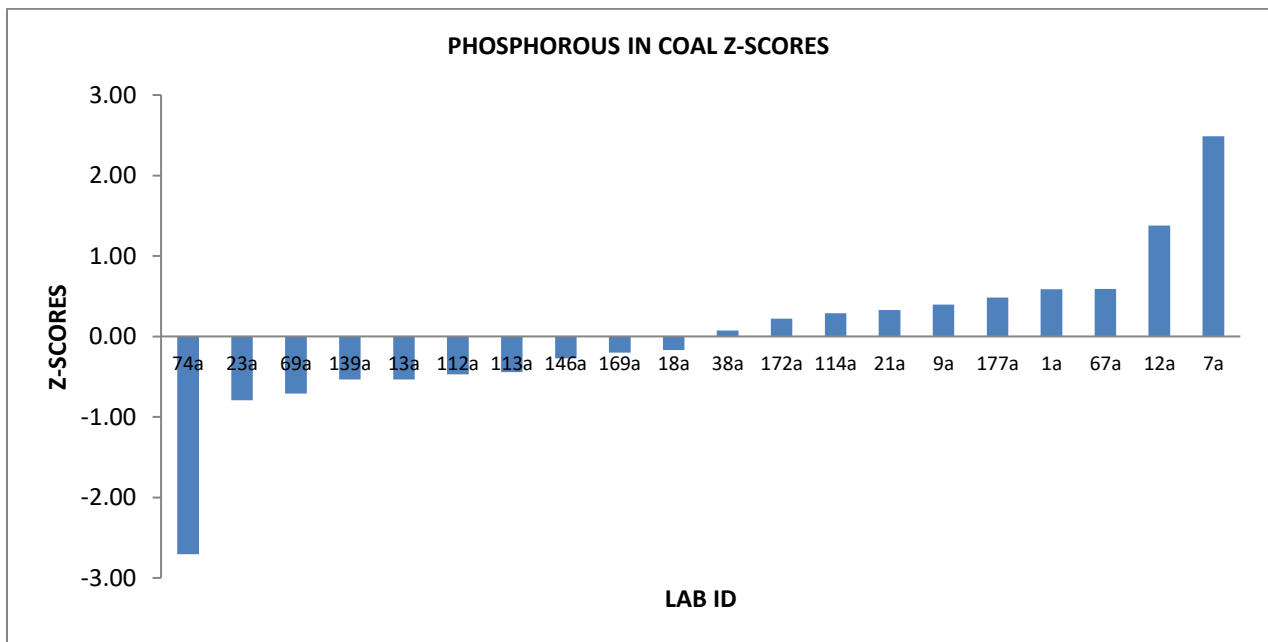
LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
1a	5.44	0.55	0.58	0.59
<b><u>7a</u></b>	3.36	<b><u>0.25</u></b>	<b><u>0.26</u></b>	<b><u>-4.73</u></b>
9a	5.50	0.47	0.50	-0.80
10a	5.19	0.51	0.54	-0.13
12a	5.67	0.52	0.55	0.00
13a	5.30	0.54	0.57	0.40
18a	4.54	0.52	0.54	-0.02
21a	4.43	0.47	0.49	-0.89
23a	5.25	0.51	0.54	-0.12
28a	4.45	0.49	0.51	-0.54
30a	4.74	0.49	0.51	-0.52
32a	4.50	0.54	0.57	0.32
35a	4.59	0.50	0.52	-0.36
36a	4.50	0.55	0.58	0.50
37a	5.40	0.46	0.49	-0.98
38a	5.45	0.53	0.56	0.24
39a	4.83	0.48	0.50	-0.68
42a	4.85	0.52	0.55	0.00
49a	4.73	0.53	0.56	0.17
50a	5.03	0.56	0.59	0.72
58a	5.30	0.54	0.57	0.40
60a	4.77	0.52	0.55	0.00
69a	5.25	0.51	0.54	-0.12
71a	4.70	0.53	0.56	0.17
74a	4.55	0.48	0.50	-0.71
76a	4.93	0.51	0.54	-0.15
79a	4.72	0.52	0.55	0.00
80a	5.00	0.46	0.48	-1.01
88a	5.45	0.47	0.50	-0.80
91a	4.30	0.42	0.44	-1.76
95a	5.70	0.58	0.62	1.14
97a	4.33	0.54	0.56	0.31
99a	5.20	0.53	0.56	0.22
106a	5.13	0.67	0.71	2.64
110a	4.89	0.56	0.59	0.71
112a	5.00	0.51	0.54	-0.15
113a	5.37	0.50	0.53	-0.29
130a	4.70	0.50	0.52	-0.35
135a	5.04	0.56	0.59	0.72
139a	5.29	0.53	0.56	0.23
140a	4.40	0.46	0.48	-1.06
143a	5.24	0.48	0.51	-0.65
145a	5.08	0.46	0.48	-1.01
146a	5.40	0.52	0.55	0.0
151a	5.20	0.52	0.55	0.0
161a	5.20	0.39	0.41	-2.21
162a	5.30	0.54	0.57	0.40
167a	5.20	0.44	0.46	-1.34
169a	4.18	0.50	0.52	-0.39
172a	5.18	0.52	0.55	0.0
177a	4.28	0.50	0.52	-0.39
181a	5.30	0.68	0.72	2.84
184a	4.90	0.45	0.47	-1.19
187a	4.73	0.63	0.66	1.90
188a	5.70	0.49	0.52	-0.43
189a	4.53	0.49	0.51	-0.54
198a	4.50	0.50	0.52	-0.37
199a	5.41	0.48	0.51	-0.63
201a	5.28	0.49	0.52	-0.47
202a	5.21	0.48	0.51	-0.65
207a	5.10	0.61	0.64	1.60
211a	4.63	0.69	0.72	2.93
<b><u>215a</u></b>	5.62	<b><u>0.26</u></b>	<b><u>0.28</u></b>	<b><u>-4.45</u></b>
216a	3.43	0.66	0.68	2.27
<b>NUMBER OF RESULTS</b>	<b>64</b>	<b>64</b>	<b>64</b>	<b>-</b>
<b>OUTLIERS</b>	<b>-</b>	<b>2</b>	<b>2</b>	<b>-</b>
<b>AVERAGE</b>	<b>4.94</b>	<b>0.52</b>	<b>0.55</b>	<b>-</b>
<b>MEDIAN</b>	<b>-</b>	<b>0.51</b>	<b>0.54</b>	<b>-</b>
<b>STD DEVIATION</b>	<b>-</b>	<b>0.06</b>	<b>0.06</b>	<b>-</b>
<b>ROBUST AVERAGE</b>	<b>-</b>	<b>0.52</b>	<b>0.55</b>	<b>-</b>
<b>ROBUST STD DEVIATION</b>	<b>-</b>	<b>0.06</b>	<b>0.06</b>	<b>-</b>
<b>UoM</b>	<b>-</b>	<b>0.01</b>	<b>0.01</b>	<b>-</b>





**COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021**

ANALYTICAL PARAMETER : PHOSPHOROUS IN COAL (%)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
	1a	5.44	0.100	0.106	0.59
	7a	3.36	0.125	0.129	2.49
	9a	5.50	0.098	0.103	0.39
	12a	5.67	0.109	0.116	1.38
	13a	5.30	0.087	0.092	-0.53
	18a	4.54	0.092	0.096	-0.17
	21a	4.43	0.098	0.103	0.33
	23a	5.25	0.084	0.089	-0.79
	38a	5.45	0.094	0.099	0.07
	67a	5.50	0.100	0.106	0.59
	69a	5.25	0.085	0.090	-0.71
	74a	4.55	0.062	0.065	-2.71
	<b>99a</b>	5.20	<b>0.550</b>	<b>0.580</b>	<b>38.86</b>
	112a	5.00	0.088	0.093	-0.47
	113a	5.37	0.088	0.093	-0.44
	114a	4.99	0.097	0.102	0.29
	139a	5.29	0.087	0.092	-0.53
	146a	5.40	0.090	0.095	-0.27
	169a	4.18	0.092	0.096	-0.20
	172a	5.18	0.096	0.101	0.22
	177a	4.28	0.100	0.104	0.48
Number of results	-	21	21	21	-
OUTLIERS	-	-	1	1	-
AVERAGE	-	5.01	0.094	0.098	-
STD DEVIATION	-	-	0.012	0.012	-
MEDIAN	-	-	0.093	0.098	-
ROBUST AVERAGE	-	-	0.094	0.099	-
ROBUST STD DEVIATION	-	-	0.008	0.009	-
UoM	-	-	0.002	0.003	-



COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021					
ANALYTICAL PARAMETER : TOTAL CARBON (%)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
	1a	5.44	62.71	66.32	-0.10
	9a	5.50	63.68	67.39	1.38
	12a	5.67	63.11	66.90	0.71
	18a	4.54	63.02	66.02	-0.52
	21a	4.43	63.50	66.44	0.08
	42a	4.85	62.76	65.96	-0.60
	<b>43a</b>	5.00	<b>68.00</b>	<b>71.58</b>	<b>7.20</b>
	74a	4.55	62.79	65.78	-0.84
	88a	5.45	63.67	67.34	1.32
	99a	5.20	63.20	66.67	0.39
	<b>145a</b>	5.08	<b>65.70</b>	<b>69.22</b>	<b>3.92</b>
	177a	4.28	62.20	64.98	-1.95
	202a	5.21	63.57	67.06	0.94
	216a	3.43	63.55	65.81	-0.81
Number of results	-	14	14	14	-
OUTLIERS	-	-	<b>2</b>	<b>2</b>	-
AVERAGE	-	<b>4.90</b>	<b>63.15</b>	<b>66.39</b>	-
MEDIAN	-	-	<b>63.16</b>	<b>66.38</b>	-
STD DEVIATION	-	-	<b>0.47</b>	<b>0.72</b>	-
ROBUST AVERAGE	-	-	63.19	66.43	
ROBUST STD DEVIATION	-	-	0.55	0.82	
UoM	-	-	0.19	0.28	

COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021					
ANALYTICAL PARAMETER : HYDROGEN (%)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
	1a	5.44	3.21	3.39	-0.79
	9a	5.50	3.15	3.33	-1.01
	12a	5.67	3.47	3.68	0.24
	18a	4.54	3.59	3.76	0.54
	21a	4.43	3.27	3.42	-0.69
	42a	4.85	3.16	3.32	-1.05
	43a	5.00	3.90	4.11	1.79
	88a	5.45	3.42	3.62	0.02
	99a	5.20	3.30	3.48	-0.47
	177a	4.28	3.83	4.00	1.41
	<b>202a</b>	5.21	<b>4.78</b>	<b>5.04</b>	<b>5.19</b>
Number of results	-	11	11	11	
OUTLIERS	-	-	<b>1</b>	<b>1</b>	-
AVERAGE	-	<b>5.05</b>	<b>3.43</b>	<b>3.61</b>	-
MEDIAN	-	-	<b>3.36</b>	<b>3.55</b>	-
STD DEVIATION	-	-	<b>0.27</b>	<b>0.28</b>	-
ROBUST AVERAGE	-	-	3.41	3.59	
ROBUST STD DEVIATION	-	-	0.37	0.37	
UoM	-	-	0.15	0.15	

COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021					
ANALYTICAL PARAMETER : NITROGEN (%)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
	1a	5.44	1.42	1.50	-1.31
	9a	5.50	1.54	1.63	0.75
	12a	5.67	1.45	1.54	-0.74
	18a	4.54	1.51	1.58	0.0
	42a	4.85	1.50	1.58	0.0
	43a	5.00	1.61	1.69	1.80
	88a	5.45	1.46	1.54	-0.62
	99a	5.20	1.48	1.56	-0.35
	177a	4.28	1.47	1.54	-0.76
	202a	5.21	1.58	1.67	1.35
Number of results	-	10	10	10	-
OUTLIERS	-	-	<b>0</b>	<b>0</b>	-
AVERAGE	-	<b>5.11</b>	<b>1.50</b>	<b>1.58</b>	-
MEDIAN	-	-	<b>1.49</b>	<b>1.57</b>	-
STD DEVIATION	-	-	<b>0.06</b>	<b>0.06</b>	-
ROBUST AVERAGE	-	-	1.50	1.58	
ROBUST STD DEVIATION	-	-	0.07	0.08	
UoM	-	-	0.03	0.03	

ANALYTICAL PARAMETER : ASH FUSION TEMPERATURES (oC)				
LAB ID	DEFORMATION	SOFTENING	HEMISPHERE	FLOW
1a	1400	1422	1441	1497
9a	1405	1425	1450	1480
10a	1420	1450	1480	1500
<b>18a</b>	1380	1400	1420	<b>1450</b>
21a	1405	1425	1465	1490
23a	1400	1440	1480	1500
28a	1370	1400	1450	1480
38a	1410	1425	1450	1470
42a	1430	1450	1470	1480
49a	1360	1410	1420	1480
60a	1360	1393	1442	1500
80a	1380	1430	1450	1490
95a	1410	1430	1450	1480
112a	1480	1500	1500	1500
145a	1430	1460	1470	1490
151a	1440	1460	1500	1500
167a	1390	1420	1450	1480
Number of results	17	17	17	17
Outliers	0	0	0	1
AVERAGE	1404	1432	1458	1489
MEDIAN	1405	1425	1450	1490
STDEV	31	27	23	10
REPRODUCIBILITY				
UPPER LIMIT	1484	1492	1518	1500
LOWER LIMIT	1324	1372	1398	1409

Z-SCORES				
LAB ID	DEFORMATION	SOFTENING	HEMISPHERE	FLOW
1a	-0,13	-0,37	-0,74	0,84
9a	0,03	-0,25	-0,35	-0,85
10a	0,52	0,68	0,94	1,14
<b>18a</b>	-0,78	-1,19	-1,64	<b>-3,84</b>
21a	0,03	-0,25	0,30	0,14
23a	-0,13	0,31	0,94	1,14
28a	-1,11	-1,19	-0,35	-0,85
38a	0,19	-0,25	-0,35	-1,85
42a	0,84	0,68	0,51	-0,85
49a	-1,43	-0,82	-1,64	-0,85
60a	-1,43	-1,46	-0,69	1,14
80a	-0,78	-0,07	-0,35	0,14
95a	0,19	-0,07	-0,35	-0,85
112a	2,47	2,56	1,80	1,14
145a	0,84	1,06	0,51	0,14
151a	1,17	1,06	1,80	1,14
167a	-0,46	-0,44	-0,35	-0,85

COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021					
ANALYTICAL PARAMETER : ASTM ASH (%)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY (%)	DRY BASE (%)	Z-SCORE (DRY BASE)
	1a	5.44	17.87	18.90	-0.09
	12a	5.12	17.87	18.83	-0.87
	202a	5.21	18.03	19.02	1.42
	209a	5.55	17.82	18.87	-0.47
<b>Number of results</b>	-	<b>4</b>	<b>4</b>	<b>4</b>	-
<b>OUTLIERS</b>	-	-	<b>0</b>	<b>0</b>	-
<b>AVERAGE</b>	-	<b>5.28</b>	<b>17.90</b>	<b>18.91</b>	-
<b>STD DEVIATION</b>	-	-	<b>0.09</b>	<b>0.08</b>	-
<b>MEDIAN</b>	-	-	<b>17.87</b>	<b>18.88</b>	-

COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021					
ANALYTICAL PARAMETER : ASTM VOLS (%)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY (%)	DRY BASE (%)	Z-SCORE (DRY BASE)
	1a	5.44	22.88	24.20	-1.14
	12a	5.12	23.30	24.56	-0.43
	202a	5.21	23.69	24.99	0.42
	209a	5.55	23.96	25.37	1.16
<b>Number of results</b>	-	<b>4</b>	<b>4</b>	<b>4</b>	-
<b>OUTLIERS</b>	-	-	<b>0</b>	<b>0</b>	-
<b>AVERAGE</b>	-	<b>5.28</b>	<b>23.46</b>	<b>24.78</b>	-
<b>STD DEVIATION</b>	-	-	<b>0.47</b>	<b>0.51</b>	-
<b>MEDIAN</b>	-	-	<b>23.50</b>	<b>24.77</b>	-

COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021					
ANALYTICAL PARAMETER : CHLORINE (ppm)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
	12a	5.67	86	91	-
	216a	3.43	130	135	-
<b>Number of results</b>	-	<b>2</b>	<b>2</b>	<b>2</b>	-
<b>OUTLIERS</b>	-	-	-	-	-
<b>AVERAGE</b>	-	<b>4.55</b>	-	-	-
<b>STD DEVIATION</b>	-	-	-	-	-
<b>MEDIAN</b>	-	-	-	-	-

COAL CONCEPTS - PROFICIENCY TESTING - JANUARY 2021					
ANALYTICAL PARAMETER : FLUORINE (ppm)					
	LAB ID	MOISTURE IN ANALYSIS SAMPLE (%)	AIR DRY	DRY BASE	Z-SCORE (DRY BASE)
	12a	5.67	143	152	-
	169a	4.18	176	184	-
	177a	4.28	204	213	-
<b>Number of results</b>	-	<b>3</b>	<b>3</b>	<b>3</b>	-
<b>OUTLIERS</b>	-	-	-	-	-
<b>AVERAGE</b>	-	<b>4.71</b>	<b>174</b>	<b>183</b>	-
<b>STD DEVIATION</b>	-	-	<b>31</b>	<b>31</b>	-
<b>MEDIAN</b>	-	-	<b>176</b>	<b>184</b>	-

## CONCLUSIONS

1. The ISO Ash z-score trend is evenly distributed. The Robust average and Average are the same at 18.90%.
2. The overall ISO volatile trend is evenly distributed. Three outliers were detected. These seemed to be due to calculation and analytical errors.
3. Calorific value trend is evenly distributed. Eight outliers were detected. These were due to analytical errors.
4. The sulphur z-score trend is evenly distributed. The average and robust average are the same. Two extreme outliers were detected. These were due to analytical errors.
5. Phosphorous analysis: The z-score trend is evenly distributed. One outlier detected. Generally well done
6. Carbon, Hydrogen and Nitrogen: Generally acceptable results were obtained on Carbon and Hydrogen. One outlier was detected on Carbon and one on Hydrogen
7. One outlier was detected on Aft Deformation.

### 8. Assessment criterion for homogeneity check

8.1 Comparison of the between sample standard deviation with the standard deviation for proficiency testing

Standard deviation for ISO ash = 0.15

Check value =  $0.15 \times 0.3 = 0.045$

Between sample standard deviation = 0.067

The between standard deviation is greater than the check value for the criterion assessment for homogeneity, therefore the following assessment will be used to establish homogeneity:

Calculate  $\sigma^2_{\text{allow}} = (0.3 \sigma_{\text{pt}})^2 = (0.3 \times 0.15)^2 = 0.002025$

Calculate  $c = F_1 \sigma^2_{\text{allow}} + F_2 s^2_w = (1.59 \times 0.002025) + (0.57 \times 0.013689) = 0.015714$

$\sqrt{c} > S_s$  Samples are homogenous

$\sqrt{0.015714} = 0.125$

Since 0.067 is less than 0.125, the batch of test items is homogenous.

**COAL CONCEPTS: Terms and Conditions**Return of results:

Laboratories participate in proficiency testing programs on the understanding that they will be sharing their results and information **anonymously** with other laboratories performing the same analysis. No return of results compromises the spirit of the programs, and reports will not be sent to laboratories unless they return results. Payment in full is required from all laboratories enrolling whether they return results or not.

Errors in Participant Proficiency Testing Results:

Proficiency testing reports should reflect the level of accuracy that a regular testing client would receive.

If a participant finds an error in their proficiency testing results, they may notify us in writing and change their submission **PRIOR** to the due date for return. Changes after this time will not be accepted.

Coal Concepts' reports results *as submitted* by participants.

On occasion, it seems as though participants have mixed up the samples or not processed the samples according to the instructions. Coal Concepts cannot make assumptions of this nature and change results 'to suit'. We also cannot compromise the integrity of the programs by suggesting to some participants that they should review their results prior to the due date. (This is unfair to other participants) It is the responsibility of the participants to check all aspects of the program, including sample identification, preparation, testing instructions, calculations and reporting of the results prior to results submission.

If samples are not in good condition on arrival to the participant laboratory, Coal Concepts must be notified in writing IMMEDIATELY, as often samples can be replaced in good time. Claims about samples received in bad condition will not be accepted after the report has been issued.

Late Enrolments and Late Results:

Late enrolment requests cannot always be accommodated, as sample manufacture must be scheduled well in advance to the shipping date of the program to allow all necessary quality assurance activities to be carried out.

Shipping of PT materials and evaluating test results from PTPs out of cycle with the mainstream programs is considerably time consuming and therefore costly.

In order not to disadvantage participants able to comply with time frames, Coal Concepts may charge a late fee in the following circumstances:

Requests that Coal concepts staff enters results on behalf of participants

Requests to record results after the due date

Requests for PTP participation that is out of cycle with the scheduled dates

Shipping fees and Customs clearance:

Costs incurred for shipping samples and clearance of same through customs are the responsibility of the participating laboratory unless otherwise indicated

Non-payment of fees:

Coal Concepts retains the right to withhold reports and/or test materials and services when invoices are outstanding.

Confidentiality of results:

All data and information received by Coal Concepts from its clients are considered confidential unless the client has given express permission to pass on information.

Definitions:

The dictionary definitions of "collusion" and "falsification" are as follows.

· *Collusion*: A secret agreement or cooperation for a fraudulent or deceitful purpose.

· *Falsification*: Deliberately changing something to be false. In proficiency testing terms, collusion is comparing data (and perhaps changing data) to fit in with a believed "correct" result. This is contrary to the spirit of proficiency testing programs, which are issued with the intention of providing an objective comparison of a laboratory's performance with others. Coal Concepts tries to minimise the occurrence of collusion by being aware that laboratories should be objective when they report their results, and should therefore not know the intended results at the time they are reporting to us.

Answers are not provided to clients until results have been submitted.

To prevent collusion and falsification our advice to clients is:

DON'T confer with others about PT samples or results.

DO accept the fact that everyone makes errors.

DON'T average the results or opinions of every person in the laboratory before selecting the answer to be submitted. Instead, use one of the answers AS SUBMITTED to you and take advantage of the Coal Concepts internal QA services and submit all answers generated by the technicians.

DO have confidence in your own results.

Proficiency Testing (PT) is a compulsory part of laboratory accreditation, but it is also an important tool for giving you confidence in your results. "Enhancing" your PT results with assistance from another participant cannot increase confidence in your laboratory's performance.

Coal concepts' testing staff are not told what the expected results are, nor what we are expecting.

We subject ALL results to analysis, even if they are different.

The staff have the right to check that the results we enter on their behalf are correctly transcribed.

Clients are always welcome to contact Coal Concepts to seek advice or information about collusion or falsification of data.

Policy for Participant Appeal of PT Performance Assessment:

If participants disagree with their performance assessment in a proficiency report, they should inform Coal Concepts in writing.

The response will include Coal Concepts interpretation of the outcome of the reassessment and an explanation of that outcome. (For example, explanation of a calculation, or the rationale for the outcome of the evaluation.)

If a mistake has been made by Coal Concepts, it will be dealt with via Coal Concepts' non-conformance system.

Liability

In no event shall a party's liability to the other party for direct damages exceed an amount equal to the value of the amount for the PT Programme, under that specific month

**End of report**