



**Office of the Chief Executive**

**Assurance and Forensic Department**

Contracted University of Fort Hare to execute this project

**Measurement and Verification**

**Project Name: Union Mine**

**Project Number: 2010093**

**Report Type: Performance Assessment Report 3**

**Reporting Period: 01 May 2013 – 31 May 2013**

**Compiled by:** ..... **Date:** 02 July 2013

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Office of the Chief Executive  
Assurance and Forensic Department  
Eskom

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## 1 Monthly savings report: May 2013

### 1.1 Project information

**Project name:** Union Mine Composite Fiber

**Project number:** 2010093

**Project Type:** Industrial Energy Efficiency

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**Report period:** May 2013

**Date of completion:** March 2013

**Intended Impact:** N/A

### 1. Executive Summary

The 3<sup>rd</sup> performance assessment of the Union Mine Composite Fiber for the period of May 2013 resulted in an average demand impact of **0.707 MW** and the energy consumption was **526.142 MWh**.

The performance tracking of Union Mine Composite Project (EE) for the period of 14 February 2013 – 30 June 2013 resulted in an average weekday demand impact of **0.695 MW** during the weekday evening peak period of Eskom. The contracted demand impact for the same period is **0.486 MW**. The impact on the energy consumption for 14 February 2013 – 30 June 2013 was **2 840.138 MWh**.

A summary of the energy and demand impacts for May 2013 (current month) is section 1.2 below. The summary for the energy and demand impacts for 14 February 2013 – 30 June 2013 (ITD) is given in section 2.1 below. The summary of the energy and demand impacts for the YTD (01 April 2013 – 30 June 2013) period is given in section 3.1 below.

### M&V Opinion:

Considering the challenges we had with regards to measurements of a huge sample of the fans, the data obtained from the measured ones can be a fairly good representative of the remaining fans, as such the average measured values were used to do both the adjustment and finally the savings of the report. All the installed fans are in perfect working condition as attested by the Mining underground ventilation manager.

# 1 PERFORMANCE ASSESSMENT

## 1.1 Monthly DSM impact: 1 - 31 May 2013

Table 1							
01 May 2013 - 31 May 2013							
Average Demand (MW) TOU periods							
Weekday (MW)							
	Morning Off peak	Morning Standard	Morning Peak	Mdday Standard	Evening Peak	Evening Standard	Evening Off-peak
Av. Baseline (MW)	1.648	1.649	1.646	1.648	1.648	1.645	1.647
Av. Actual (MW)	0.941	0.942	0.940	0.941	0.942	0.940	0.941
Av. Impact (MW)	0.707	0.707	0.706	0.706	0.707	0.705	0.706
Saturday (MW)						Sunday (MW)	
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak	
Av. Baseline (MW)	1.646	1.645	1.646	1.644	1.645	1.651	
Av. Actual (MW)	0.941	0.940	0.941	0.940	0.940	0.937	
Av. Impact (MW)	0.705	0.705	0.705	0.705	0.705	0.714	
Table 2							
Energy Consumption (MWh) TOU periods							
Monthly Weekday (MWh)							
	Morning Off peak	Morning Standard	Morning Peak	Mdday Standard	Evening Peak	Evening Standard	Evening Off-peak
Baseline (MWh)	227.393	37.933	113.562	303.174	75.823	75.672	75.781
Actual (MWh)	129.895	21.669	64.871	173.184	43.313	43.226	43.289
Combined Impact (MWh)	97.498	16.264	48.692	129.991	32.510	32.446	32.492
Monthly Saturday (MWh)						Monthly Sunday (MWh)	Total Monthly Av. MWh
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak	
Baseline (MWh)	46.086	32.894	39.505	13.155	26.319	158.539	1,225.838
Actual (MWh)	26.335	18.797	22.575	7.517	15.040	89.987	699.697
Combined Impact (MWh)	19.751	14.097	16.931	5.638	11.280	68.552	526.142
Table 3							
Weekday (Rand)		Saturday & Sunday (Rand)		Total			
	Max Demand	Electricity Consu	Max Demand	Electricity Consum	Rand		
Baseline	79,336.61	336,455.74	79,242.88	116,889.83	611,925.07		
Actual	45,319.80	33,397.49	45,282.18	66,794.98	190,794.44		
Combined Impact	34,016.81	303,058.25	33,960.70	50,094.86	421,130.63		
Table 4							
Emission values		CO <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	Particles	Water use	
Energy		kg	kg	kg	kg	l	
MWh		980	4.39	8.10	0.39	1.38	
Baseline	1225.838	1,201,321.682	5,381.431	9,929.291	478.077	1,691.657	
Actual	699.697	685,702.617	3,071.668	5,667.542	272.882	965.581	
Combined Impact	526.142	515,619.065	2,309.763	4,261.749	205.195	726.076	

## 2 Accumulated savings report: 14 February 2013 – 30 June 2013

### 2.1 Accumulated DSM impact: ITD

Table 1							
ITD		14 February 2013 - 30 June 2013					
<b>Weekday (MW)</b>							
	Morning Off peak	Morning Standard	Morning Peak	Mdday Standard	Evening Peak	Evening Standard	Evening Off-peak
<b>Av. Baseline (MW)</b>	1.648	1.649	1.646	1.648	1.648	1.645	1.647
<b>Av. Actual (MW)</b>	0.953	0.954	0.953	0.953	0.953	0.952	0.953
<b>Av. Impact (MW)</b>	<b>0.694</b>	<b>0.695</b>	<b>0.693</b>	<b>0.695</b>	<b>0.695</b>	<b>0.693</b>	<b>0.694</b>
<b>Saturday (MW)</b>							
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	<b>Sunday (MW)</b>	
<b>Baseline (MW)</b>	1.646	1.645	1.646	1.644	1.645	1.651	
<b>Actual (MW)</b>	0.953	0.952	0.951	0.950	0.950	0.947	
<b>Combined Impact (MW)</b>	<b>0.693</b>	<b>0.693</b>	<b>0.695</b>	<b>0.694</b>	<b>0.695</b>	<b>0.704</b>	
<b>Table 2</b>							
<b>Energy Consumption (MWh) TOU periods</b>							
<b>ITD Weekday (MWh)</b>							
	Morning Off peak	Morning Standard	Morning Peak	Mdday Standard	Evening Peak	Evening Standard	Evening Off-peak
<b>Baseline (MWh)</b>	1,166.626	194.613	582.624	1,555.417	389.007	388.230	388.791
<b>Actual (MWh)</b>	666.417	111.170	332.815	888.508	222.214	221.770	222.091
<b>Combined Impact (MWh)</b>	<b>500.209</b>	<b>83.444</b>	<b>249.809</b>	<b>666.909</b>	<b>166.793</b>	<b>166.460</b>	<b>166.700</b>
<b>Monthly Saturday (MWh)</b>							
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	<b>Monthly Sunday (MWh)</b>	<b>Total ITD Av. MWh</b>
<b>Baseline (MWh)</b>	288.038	205.585	246.909	82.217	164.497	990.871	6,643.425
<b>Actual (MWh)</b>	176.332	117.479	141.093	46.982	93.999	562.418	3,803.287
<b>Combined Impact (MWh)</b>	<b>111.706</b>	<b>88.106</b>	<b>105.817</b>	<b>35.235</b>	<b>70.497</b>	<b>428.453</b>	<b>2,840.138</b>
<b>Table 3</b>							
<b>Weekday (Rand)</b>		<b>Saturday &amp; Sunday (Rand)</b>			<b>Total</b>		
	<b>Max Demand</b>	<b>Electricity Consumed</b>	<b>Max Demand</b>	<b>Electricity Consumed</b>	<b>Rand</b>		
<b>Baseline</b>	79,336.61	1,726,164.25	79,242.88	731,903.03	2,616,646.76		
<b>Actual</b>	45,319.80	986,044.35	45,282.18	421,171.68	1,497,818.00		
<b>Combined Impact</b>	<b>34,016.81</b>	<b>740,119.90</b>	<b>33,960.70</b>	<b>310,731.35</b>	<b>1,118,828.76</b>		
<b>Table 4</b>							
<b>Emmission values</b>	<b>Energy</b>	<b>CO<sub>2</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>Particles</b>	<b>Water use</b>	
	<b>MWh</b>	kg	kg	kg	kg	l	
<b>Baseline</b>	6,643.425	6,510,556.558	29,164.636	53,811.743	2,590.936	9,167.927	
<b>Actual</b>	3,803.287	3,727,220.828	16,696.428	30,806.621	1,483.282	5,248.535	
<b>Combined Impact</b>	<b>2,840.138</b>	<b>2,783,335.730</b>	<b>12,468.208</b>	<b>23,005.122</b>	<b>1,107.654</b>	<b>3,919.391</b>	

**3 Accumulated DSM impact: YTD (01 April 2013 – 30 June 2013)**

Table 1	YTD	01 April 2013 - 30 June 2013						
<b>Weekday (MW)</b>								
	Morning Off peak	Morning Standard	Morning Peak	Mdday Standard	Evening Peak	Evening Standard	Evening Off-peak	
<b>Baseline (MW)</b>	1.648	1.649	1.646	1.648	1.648	1.645	1.647	
<b>Actual (MW)</b>	0.953	0.954	0.953	0.953	0.953	0.952	0.953	
<b>Combined Impact (MW)</b>	<b>0.694</b>	<b>0.695</b>	<b>0.693</b>	<b>0.695</b>	<b>0.695</b>	<b>0.693</b>	<b>0.694</b>	
<b>Saturday (MW)</b>							<b>Sunday (MW)</b>	
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak		
<b>Baseline (MW)</b>	1.646	1.645	1.646	1.644	1.645	1.651		
<b>Actual (MW)</b>	0.953	0.952	0.951	0.950	0.950	0.947		
<b>Combined Impact (MW)</b>	<b>0.693</b>	<b>0.693</b>	<b>0.695</b>	<b>0.694</b>	<b>0.695</b>	<b>0.704</b>		
Table 2	Energy Consumption (MWh) TOU periods							
<b>YTD Weekday (MWh)</b>								
	Morning Off peak	Morning Standard	Morning Peak	Mdday Standard	Evening Peak	Evening Standard	Evening Off-peak	
<b>Baseline (MWh)</b>	107.105	107.202	106.979	107.100	107.142	106.928	107.082	
<b>Actual (MWh)</b>	61.976	62.023	61.965	61.953	61.966	61.901	61.942	
<b>Combined Impact (MWh)</b>	<b>45.129</b>	<b>45.179</b>	<b>45.014</b>	<b>45.147</b>	<b>45.176</b>	<b>45.027</b>	<b>45.140</b>	
<b>Monthly Saturday (MWh)</b>						<b>Monthly Sunday (MWh)</b>	<b>Total YTD Av. MWh</b>	
	Morning Off peak	Morning Standard	Midday off peak	Evening Standard	Evening Off-peak	Sunday Off-peak		
<b>Baseline (MWh)</b>	21.397	21.381	21.399	21.376	21.385	21.469	877.945	
<b>Actual (MWh)</b>	12.389	12.371	12.364	12.349	12.345	12.312	507.857	
<b>Combined Impact (MWh)</b>	<b>9.008</b>	<b>9.010</b>	<b>9.034</b>	<b>9.027</b>	<b>9.039</b>	<b>9.157</b>	<b>370.088</b>	
Table 3	Weekday (Rand)					Saturday & Sunday (Rand)		Total
	Max Demand	Electricity Consumed	Max Demand	Electricity Consumed	Rand			
<b>Baseline</b>	79,336.61	277,329.20	79,242.88	47,510.41	483,419.10			
<b>Actual</b>	45,319.80	160,478.58	45,282.18	27,428.55	278,509.11			
<b>Combined Impact</b>	<b>34,016.81</b>	<b>116,850.62</b>	<b>33,960.70</b>	<b>20,081.86</b>	<b>204,909.99</b>			
Table 4	Emission values							
	Energy	CO <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	Particles	Water use		
	MWh	kg	kg	kg	kg	l		
<b>Baseline</b>	877.945	860,385.999	3,854.178	7,111.354	342.399	1,211.564		
<b>Actual</b>	507.857	497,699.970	2,229.493	4,113.643	198.064	700.843		
<b>Combined Impact</b>	<b>370.088</b>	<b>362,686.028</b>	<b>1,624.685</b>	<b>2,997.711</b>	<b>144.334</b>	<b>510.721</b>		

## 7 Comments

This report which was supposed to follow after the 1<sup>st</sup> and the 2<sup>nd</sup> PA report was delayed due to some logistical problems with the mine in securing the date for going underground. This could have been compounded by the challenging dynamics currently happening in the mining sector. The report reveals that the project is performing above the target as an average for the entire 36 fans.