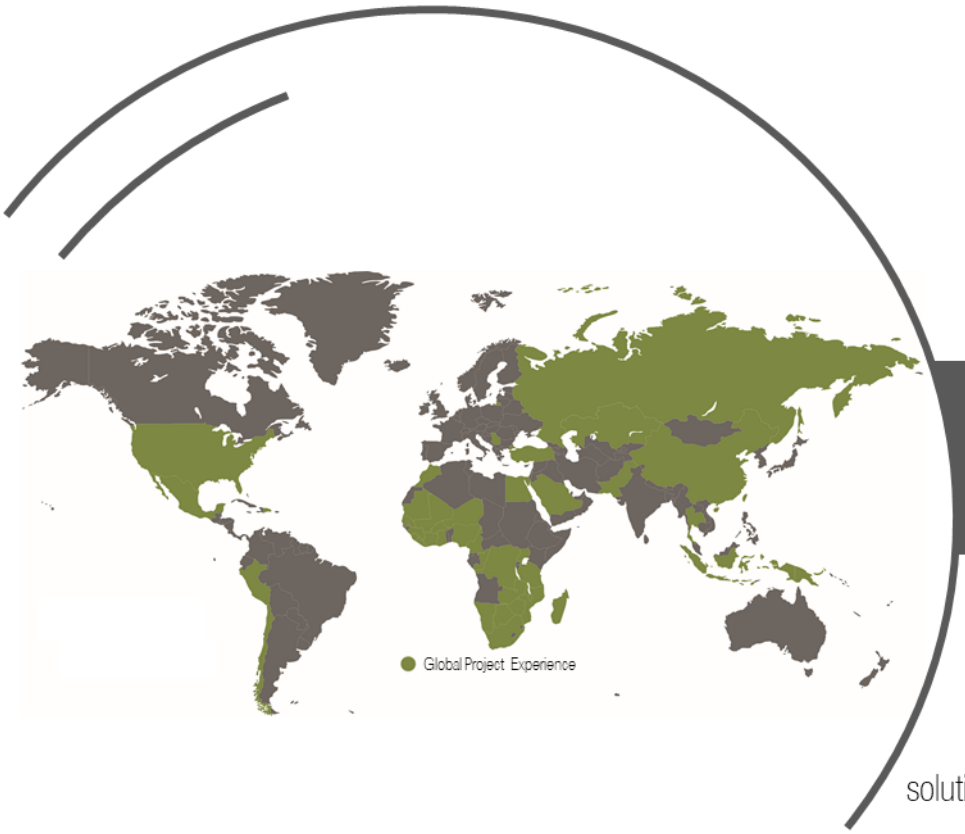

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Closure Cost Assessment - Digby Wells Methodology

Prepared for:
Universal Coal Development IV (Pty) Ltd

Project Number:
UCD6587

June 2021

Digby Wells and Associates (South Africa) (Pty) Ltd
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This document has been prepared by Digby Wells Environmental.

Report Type:	Closure Cost Assessment - Digby Wells Methodology
Project Name:	**Error! Reference source not found.**
Project Code:	UCD6587

Name	Responsibility	Signature	Date
Stawm Malan	Report Compilation		May 2021
Leon Ellis	Reviewer		May 2021
Mia Smith	Reviewer		June 2021

DECLARATION OF INDEPENDENCE

Digby Wells and Associates (South Africa) (Pty) Ltd

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I, Stawm Malan, as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Universal Coal Development IV (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Middeldrift Project Financial Provision Assessment.

_____

Full name:	Stawm Malan
Title/ Position:	Mine Closure Consultant
Qualification(s):	MSc Environmental Science
Experience (years):	6

EXECUTIVE SUMMARY

Universal Coal Development IV (Pty) Ltd (Universal Coal) operates the New Clydesdale Colliery (NCC), situated in the Nkangala Magisterial District of the Mpumalanga Province with Mining Right (MR) reference **MR Ref. No. MP30/5/1/2/2/492MR.**

Universal Coal had identified coal resources north of this existing MR and as such is proposing to extend the proposed North Opencast Pit to the Middeldrift Resources (Middeldrift). This involves the following activities:

- Opencast coal mining through a pan (wetland);
- Diversion of the district road D1651;
- Construction of a new road (linked to the diversion) (approximately 4 km long); and
- Construction of a bridge over the Steenkoolspruit.

Digby Wells Environmental (Digby Wells) has been appointed by Universal Coal to undertake an Environmental Authorisation (EA) Application Process for the mining of Middeldrift within the existing NCC MR boundary (the “Project”). This will include the undertaking of a Scoping and Environmental Impact Assessment (EIA) process and compilation of an Environmental Management Programme (EMPr); and applications for an Integrated Water Use License (IWUL) supported by an Integrated Water and Waste Management Plan (IWWMP).

This report details the methodology and assumptions applied in the Life of Mine (LoM) Closure Cost Assessment undertaken by Digby Wells, in support of the above-mentioned EA Application process. The closure cost assessment was undertaken using the closure cost methodology prescribed by the Financial Provisioning Regulations, 2015 (GN R1147 of 20 November 2015) (as amended) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

The Closure Cost Assessment using the aforementioned methodology resulted in a total closure cost estimate of **R 120,902,160.00** (Excl. VAT).

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ACRONYMS AND ABBREVIATIONS

CAA	Closure Cost Assessment
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ELM	Emalahleni Local Municipality
EMPr	Environmental Management Programme
GIS	Global Information System
IWUL	Integrated Water Use License
IWWMP	Integrated Water and Waste Management Plan
LoM	Life of Mine
MR	Mining Right
NCC	New Clydesdale Colliery
NEMA	National Environmental Management Act
NMD	Nkangala Magisterial District
P&Gs	Preliminary and General
VAT	Value Added Tax

1 Introduction

Universal Coal Development IV (Pty) Ltd (Universal Coal) operates the New Clydesdale Colliery (NCC), situated in the Nkangala Magisterial District of the Mpumalanga Province with Mining Right (MR) reference **MR Ref. No. MP30/5/1/2/2/492MR.**

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This report details the methodology and assumptions applied in the life of mine (LoM) Closure Cost Assessment (CAA) undertaken by Digby Wells, in support of the above-mentioned EA Application process.

The CCA was undertaken in terms of the Financial Provisioning Regulations, 2015 (GN R1147 of 20 November 2015) (as amended) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

The closure cost estimate reflected in this report was undertaken using third-party contractor rates and is generally aligned with the requirements of the Financial Provisioning Regulations, 2015 (as amended). It is noted that the closure planning reports required in terms of the aforementioned regulations have not been compiled as part of the work.

1.1 Project Description

The property is located within the Emalahleni Local Municipality (ELM) and the Nkangala Magisterial District (NMD) and is approximately 9 km north of the town of Kriel in the Mpumalanga Province. The full project location details are presented in Table 1-1. The project locality and open pit boundaries for two open pit development options are presented in Figure 1-1

The CCA reflected in this report has been based on the development of Option 2, which carried a life of mine (LoM) of about 17 years, with closure planned for 2038.

Table 1-1: Summary of Project Location Details

	Farm Name	21-digit Surveyor General Code
Farm Name:	Portion 1 of Middeldrift 42 IS	T0IS00000000004200001
	Portion 2 of Middeldrift 42 IS	T0IS00000000004200002
	Portion 3 of Middeldrift 42 IS	T0IS00000000004200003
	Portion 4 of Middeldrift 42 IS	T0IS00000000004200004
	Portion 2 of Diepspruit 41 IS	T0IS00000000004100002
	Portion 9 of Diepspruit 41 IS	T0IS00000000004100009
	Portion 15 of Roodepoort 41 IS	T0IS00000000004000015
	Portion 21 of Roodepoort 41 IS	T0IS00000000004000021
	Portion 3 of Hartbeestfontein 39 IS	T0IS00000000003900003
	Portion 7 of Hartbeestfontein 39 IS	T0IS00000000003900007
	Portion 9 of Kromfontein 30 IS	T0IS00000000003000009
Application Area (Ha):	~150 ha	
Magisterial District:	Nkangala District Municipality	
Distance and direction from nearest town:	Approximately 9 km north of Kriel in the Mpumalanga Province	
21 digit Surveyor General Code for each farm portion:	As above.	

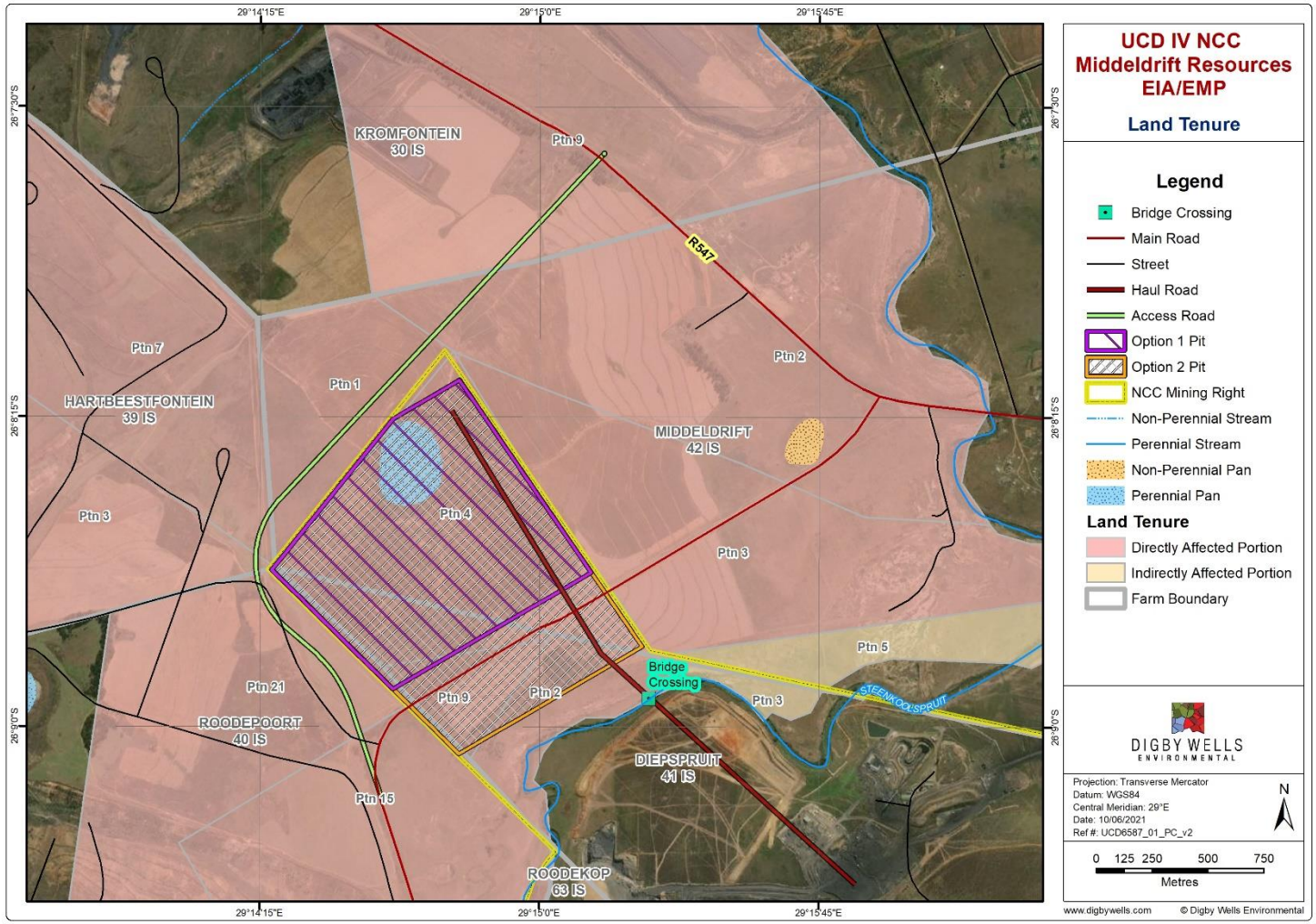

Figure 1-1: Project Area and Open Pit Development Options

1.1.1 Closure Costing Battery Limits

The battery limits for the closure costing are the following:

- Open pit rehabilitation of the final void at LoM (i.e. at 2038, assuming Option 2 will go ahead), including a haul road to the NCC processing plant and overburden dump footprint area;
- Construction of a new road (linked to the diversion) (approximately 4 km long); and
- Construction of a bridge over the Steenkoolspruit.

Note: It is assumed that the new road and bridge to be constructed will remain for beneficial use post-closure and were not included as part of the battery limits for closure at this point in time. Should it be found that these aspects will require demolition at closure, this will be included in future closure cost assessment updates to be undertaken, should the project go ahead.

2 Methodology

The methodology followed in the costing review and update involved the following actions:

- Conduct a Global Information System (GIS) based analysis to assess the volume of backfill material required for the final void at closure, assuming Option 2 as the go-ahead option (source file: *DEM_Bottom_Seam_clip_cape27.prj*);
- Input the outputs from the above work into the closure cost model;
- Develop closure measures for backfill and rehabilitation of the open pit (for Option 2);
- Assign third-party contractor rates (sourced from the Digby Wells unit rates data base) to the allocated closure measures applied; and
- Compile a succinct closure costing report (this report) describing the project outcomes.

3 Available Information

The closure costing is based on the following reports and supporting information:

- *Proposed Environmental Regulatory Process for the Middeldrift Resources Within the Existing New Clydesdale Colliery Mining Right, Situated in the Magisterial District of Nkangala, Mpumalanga Province, Final Scoping Report* – Digby Wells (March 2021);
- *New Clydesdale Colliery Middeldrift Resources, Soil, Land Use and Land Capability Impact Assessment* – Digby Wells (May 2021);
- *New Clydesdale Colliery Mining Works Programme* – Universal Coal (September 2016); and
- DEM_Bottom_Seam_clip_cape27.prj.

4 Assumptions

The closure cost assumptions and the site-specific rehabilitation and closure measures are discussed below.

4.1 General Assumptions and Exclusions

The following assumptions and exclusions were applied in the CAA:

- The closure costing addresses decommissioning, demolition, surface rehabilitation, the final closure and monitoring and corrective action of the site. Aspects that are not addressed in this costing include staffing, separation packages, retraining or reskilling, etc.;
- It is assumed that third party contractors would be commissioned to establish on site [Preliminary and General (P&Gs) costs included] and implement the mass earth works, demolition, site clean-up, related rehabilitation work and the post-rehabilitation monitoring and maintenance;
- The CCA has been undertaken for the LoM situation only (i.e. for scheduled closure at 2038, as per Option 2) since the immediate closure costs are currently not applicable due to the greenfields nature of the project;
- All quantities applied in the CCA were supplied and/or derived from information supplied by Universal Coal;
- No landform modelling was undertaken as part of this assessment;
- No legal due diligence was done as part of this assessment;
- The closure costing is based on the information provided by Universal Coal;
- The P&G costs are applied as a percentage of the total (12%). If the current amendments to the Financial Provisioning Regulations, 2015 (as amended) circulated for comment are promulgated, this figure will likely require an increase to ensure alignment with industry standards;
- A contingency of 10% has been applied in the CCA. The contingency considers price fluctuations regarding plant hire, fuel prices, possible omissions and uncertainties in the cost estimate;
- The closure cost estimate is exclusive of VAT; and
- Allowance for post-closure water treatment associated with the development of the open pit is not included in this CCA, and it is noted that the inclusion of this costs would result in a significant increase in the closure liability. Should the project go ahead, it is recommended that these costs be assessed and included for financial provisioning.

4.2 Rehabilitation and Closure Measures

The CCA for the proposed Middeldrift Project is premised on the rehabilitation and closure actions detailed in Table 4-1.

Table 4-1: Rehabilitation and Closure Measures

Area	Rehabilitation measures
Infrastructure demolition	Infrastructure demolitions and clean-up • Not applicable since there is no infrastructure to be constructed as part of the proposed Middeldrift Project. It is assumed that the new road and bridge over the Steenkoolspruit will be retained for beneficial reuse post-closure, this assumption should be confirmed in future updates of the CCA, should the project go ahead.
Open pit area	Final void backfill and rehabilitation: The final void will be backfilled to pre-determined design elevations, topsoil replaced, ripped and revegetated, as follows: • Doze backfill material (20% of total backfill material to be moved by dozer); • Load and haul backfill material (80% of backfill material to be moved by truck and shovel, with a 2 km load and haul distance applied). *The unit rate applied for load and haul was aligned with the site specific unit rate for load and haul supplied by NCC for the annual update of the NCC CCA, compiled by Digby Wells in March 2021)*; • Place topsoil to 1 000 mm (load and haul topsoil from stockpile, assume 2 km load and haul). *It is assumed the soils will be appropriately pre-stripped to the required depth, based on the pre-mining land capability assessment;* • Rip to alleviate compaction; and • Establish vegetation including soil amelioration based on dedicated sampling and analysis, seed bed preparation and the application of an appropriate seed mix. **Note:** the final void area was assumed to be 10 ha, with a volume of 2 715 567.9 m^3 (as per the *DEM*_Bottom_Seam_clip_cape27.prj file supplied by Universal Coal).

Area	Rehabilitation measures
	Overburden dump • Rip footprint area to alleviate compaction; and • Establish vegetation. Haul road: (from crusher to final coal cut at the open pit) • Rip footprint area to alleviate compaction; • Establish vegetation including soil amelioration based on dedicated sampling and analysis, seed bed preparation and the application of an appropriate seed mix; and • Allowance for any carboniferous veneers requiring clean-up (over haul roads) at closure has not been included and should be considered in future updates of the CCA.
Monitoring and maintenance	Water monitoring costs are included and will take place for five years post-closure, assuming the following: • Three groundwater points; and • Five surface water monitoring points. Vegetation monitoring and care and maintenance over the rehabilitated areas has been included for a period of five years post-closure.

5 Closure Cost Summary

The closure cost estimation for the Middeldrift Project at LoM (i.e. for scheduled closure) amounts to **R 120,902,160.00** (excl. VAT and including P&Gs and Contingencies at 12% and 10%, respectively).

The closure cost estimate breakdown is presented in Table 5-1.

Table 5-1: Overall Summary

Digby Wells Environmental **Universal Coal Development IV (Pty) Ltd, Middeldrift Project, UCD6587 Revision: 0**		
Area and Description **Infrastructure demolition**	**Current disturbance 2021**	**Life of Mine 2038**
Area 1: Middeldrift	R0	R0
Sub-total	**R0**	**R0**
Rehabilitation		
Area 1: Middeldrift	R0	R97,846,410
Sub-total	**R0**	**R97,846,410**
Monitoring and Maintenance		
Groundwater and Surface water	R0	R1,086,011
Vegetation Monitoring	R0	R20,697
Vegetation Maintenance	R0	R422,833
Sub-total	**R0**	**R1,529,541**
Preliminary and General (12%)	R0	R11,741,569
Contingency (10%)	R0	R9,784,641
GRAND TOTAL	**R0**	**R120,902,160**

6 Recommendations for Improvement

Digby Wells recommends the following to improve the resolution of the closure cost estimate and to advance the rehabilitation and closure planning and implementation accuracy:

- Consider the high-level conceptual model for the project and continually update the geohydrological and geochemical models based on monitoring results to confirm the expected water quantities and qualities post closure;
- Develop a post mining landform design for the open pit to optimise the mass earthworks to ensure backfilling is done to design elevations;
- Ensure the preferential materials handling is followed during backfilling operations, placing potentially reactive spoil material in the deepest portions of the pit prior to backfilling with inert overburden, where feasible;
- Include clean-up of contaminated sediment such as coal veneers and hydrocarbons, as/if found to be required;
- Confirm the post-mining land capability targets to be met over the rehabilitated open pit; and
- The financial provision needs to be updated on an annual basis as a requirement of the Financial Provisioning Regulations, 2015 (as amended). This will ensure that all costs become more accurate over time and will reflect prevailing market conditions.

7 Conclusion

The closure cost estimate reflected in this report was undertaken using third-party contractor rates and is generally aligned with the requirements of the Financial Provisioning Regulations, 2015 (as amended). It is noted that the closure planning reports required in terms of the aforementioned regulations have not been compiled as part of the work.

The closure cost estimate presented in this report for the scheduled closure of the Middeldrift Project are done at a high-level conceptual accuracy and are suitable for use in supporting the EA Application.

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Appendix A: Costing Sheets

DIGBY WELLS ENVIRONMENTAL			Digby Wells Environmental Universal Coal Development IV (Pty) Ltd, Middeldrift Project , UCD6587 Life of Mine Assessment, , May 2021					
Map Ref.	**Aspect Name**	**Description**	**Life of Mine 2038**					
			Class	**Quantity**	**Unit**	**Rate**	**Amount**	**Comments**
		Middeldrift						
		Demolish infrastructure						
		Not applicable						No infrastructure development planned
		Demolition Total					**R0.00**	
		Rehabilitation						
	Open pit (final void)	**Earthworks**						Accounts for backfill of final void only (see GIS output tab for volumetric/ area detail)
	Backfill	Dozing (20%)	131	543114	m³	R27.40	R14,883,870.78	Assume 20% of backfill material to be moved by dozer
		Truck and shovel (80%)	A	2172454	m³	R33.37	R72,494,554.53	Assume 80% of backfill material to be moved by T&S, 2 km load and haul applied
	Surface rehabilitation	Topsoil placement	A	101856	m³	R33.37	R3,398,923.18	Assume 1m topsoil placement to meet pre-mining land capability over the final void area. 2 km load and haul applied
		Ripping to alleviate compaction	132	10	ha	R9,267.60	R94,396.06	
		Seeding	128	10	ha	R33,210.25	R338,266.29	

DIGBY WELLS ENVIRONMENTAL			Digby Wells Environmental Universal Coal Development IV (Pty) Ltd, Middeldrift Project , UCD6587 Life of Mine Assessment, , May 2021					
Map Ref.	**Aspect Name**	**Description**	**Life of Mine 2038**					
			Class	**Quantity**	**Unit**	**Rate**	**Amount**	**Comments**
	Overburden dump	**Overburden dump footprint rehabilitation**						
		Rip to alleviate compaction	132	145	ha	R9,267.60	R1,343,801.92	Overburden dump area supplied by Universal Coal
		Establish vegetation	128	145	ha	R33,210.25	R4,815,485.79	
	Haul roads	**Haul road rehabilitation**						Final coal to crusher distance = 2.808 km. Haul road total width = 40 m (*Pers Comm*s Universal Coal).
		Rip to alleviate compaction	132	11	ha	R9,267.60	R104,093.68	
		Establish vegetation	128	11	ha	R33,210.25	R373,017.49	
		Rehabilitation Total					**R97,846,409.72**	

Vegetation Monitoring								
No.	**Description**		**Number of years**		**Unit**	**Rate**	**Distance to mine**	**Total**
1	Five hectares per hour		5		Hour	1060		
2	Travel (travel down once and complete site visits)				Km	6	330	R 1,980.00
3	Accommodation				Sum	R1,200.00		
No.	**Details Spreadsheet Area**	**Ha (converted from m^2 to ha)**	**Ha/Hrs**	**Hrs**				
1	Middeldrift Project	10.19	5.00	2.04				R4,139.35
					Total cost for 5 years post closure		**R 20,696.74**	

Vegetation Maintenance						
No.	**Description**	**Number of years**			**Unit**	**Rate**
1	Maintenance for five years for 25% of rehabilitated areas	5			Ha	R 33,210.25
No.	**Details**					
1	Middeldrift Project			**Total cost for 5 years post closure**	**R 84,566.57**	**R 422,832.86**

Groundwater Monitoring Per Spreadsheet										
	Monitoring	**Number of years**	5							
		Frequency per year	4			**Consultant Hours**				
4	Field Work (1 borehole per hour)		hour			0	0	3		R 6,360.00
5	Travelling Cost									R 7,920.00
6	Accommodation		sum							R 4,800.00
7	Lab Costs for existing boreholes		sum	R 2,150.07					3	R 25,800.83
	Lab Costs for New boreholes								0	R -
8	Report Compilation		Hour					40.00		R 84,800.00
9	Report Review		Hour				8.00			R 33,920.00
		Subtotal Monitoring costs per year				**0**	**8**	**43**		**R 163,600.83**
									Total cost for 5 years post closure	**R 818,004.13**
									Groundwater Monitoring Grand total	**R 818,004.13**

Surface water Monitoring										
No.	**Description**		**Unit**	**Costs**	**Contractor**	**Principal Consultant**	**Consultant I**	**Junior Consultant**	**Nr. Samples**	**Rate**
		Number of years	5							
		Frequency per year	4			**Consultant Hours**				
4	Field Work (1 location per hour)		hour					5		R 10,600.00
7	Lab Costs		Sum	R 2,150.07					5	R 43,001.38
	Subtotal Monitoring costs per year									R 53,601.38
Total cost for 5 years post closure										**R 268,006.88**
TOTAL Monitoring Costs (Groundwater and Surface water)										**R 1,086,011.01**