



The perceptions of women in the workplace in the South African mining industry

S Mangaroo-Pillay

orcid.org  **0000-0001-5994-6691**

Mini-dissertation submitted in partial fulfilment of the requirements
for the degree *Master of Business Administration* at the North-West
University

Supervisor: Prof CJ Botha

Graduation: May 2018
Student number: 23006242

ABSTRACT

In South Africa (SA) the government introduced the Mineral and Petroleum Resources Development Act (28 of 2002) (MPRDA) and the Broad-based Socio-economic Empowerment Charter, commonly known as the Mining Charter, for the country's Mining and Minerals Industry (commonly known as the mining industry and referred to by that name throughout this dissertation) to address the imbalances and rectify previous inequalities in this industry. This legislation required for the inclusion of women in core activities within the mining industry to be at 10% in 2009. While the 2010 amendment to the Mining Charter further required that mining houses in terms of employment equity (EE) targets be at 40% for historically disadvantaged South Africans (HDSA) in core skills, by the year 2014, in order to diversify the workplace to reflect SA's demographics and to attain competitiveness, the Reviewed Mining Charter of 15 April 2016 stipulates the same requirements. The Reviewed Mining Charter of 15 April 2016 also requires in terms of EE at executive management board level to have a 15% representation of black females with exercisable voting rights and 25% at directors' level, 30% at senior management level, 38% at middle management level and 44% at junior management level. Although the SA Government has good intentions, gender equality in the mining industry remains a challenge in SA, and many problems are encountered in the deployment of women in this industry. Emanating from this background, the main objective of the study is to establish the perceptions of women in the workplace in the SA mining industry and to determine what changes have been made over the years to accommodate women and how it affects these women. To understand pertinent issues, determine inequalities, and gain insight into the variables which impact women in the workplace in the mining industry of SA, a literature review was concluded. To examine and gauge relevant gender-related issues, an empirical study was conducted through the use of questionnaires in the form of quantitative research, using a Likert-type 5 rating scale. The questionnaires were distributed to women who attended the Annual Women in Mining Conference in SA in February 2017, which was representative of women from all over SA. As a result of the data acquired through the study, it became evident that several aspects must be considered in order for transformation to take place which will result in an improvement of the conditions experienced by women in the workplace in the SA mining industry. The study makes recommendations to the mining industry on how to make improvements to the current position of women in the workplace; and to make recommendations for future research.

Keywords: Perceptions, perspectives, women, female, mining industry, South Africa

ACKNOWLEDGEMENTS

I would like to thank the following individuals and organisations, who played a part in helping with this mini-dissertation, because without them it would have not been possible:

- God, for showing me that I have the ability and strength to achieve what I set out to do.
- My husband, Krishna Pillay, for being my pillar of strength, always motivating me and giving me continued support during my studies.
- My children, Anoushka Nandalall and Sharmishka Nandalall, for the inspiration without them knowing it and encouraging words when I felt that I could not cope.
- My parents, Deomathie and Thotharam Mangaroo, for empowering and uplifting me throughout my childhood to what I am today, which has made this study possible.
- My friends who encouraged constantly.
- My supervisor, Prof. Christoff Botha, for his professional guidance and support throughout this study.
- The Intelligence Transfer Centre (ITC) for allowing me the opportunity to distribute my questionnaires at the Annual Women in Mining Conference in February 2017 which is hosted by ITC.
- The research participants who took the time to complete the questionnaires, because, without their input, this study would not have been possible.
- Prof. Suria Ellis and the Statistical Consultation Services of the North-West University for the professional statistical support.
- Dr. Barbara Basel for assisting in the language editing and referencing.
- Ms. Antoinette Bisschoff for the professional manner in which she conducted the technical and typographical editing.

ABBREVIATIONS

COM	Chamber of mines
D & T	Development and training
DMR	Department of Minerals
EAP	Economically Active Population
EE	Employment equity
EU	European Union
HDSA	Historically disadvantaged South Africans
HRD	Human resource development
ILO	International Labour Organisation
ITC	Intelligence Transfer Centre
MENA	Middle East and North Africa
Mining Charter	Broad-based Socio-economic Empowerment Charter
MPRDA	Mineral and Petroleum Resources Development Act (28 of 2002)
PPE	Personal protective equipment
Reviewed Mining Charter	Reviewed Broad Based Black-Economic Empowerment Charter for the South African Mining and Minerals Industry, 2016: Publication of an invitation to comment on the Draft 39933
SA	South Africa
SLP	Social and labour plan
SRIs	Sex role identities
UK	United Kingdom
UN	United Nations
WIMSA	Women in Mining South Africa

TABLE OF CONTENTS

	<u>Page</u> <u>Number</u>
ABSTRACT	2
ACKNOWLEDGEMENTS	3
ABBREVIATIONS	4
LIST OF TABLES	9
LIST OF FIGURES	10
<u>CHAPTER ONE</u>	
<u>NATURE AND SCOPE OF THE STUDY</u>	11
1.1. INTRODUCTION	11
1.2. PROBLEM STATEMENT	14
1.3. RESEARCH QUESTIONS	14
1.4. OBJECTIVES OF THE STUDY	15
1.4.1. Primary objective	15
1.4.2. Secondary objectives	15
1.5. SCOPE OF STUDY	16
1.6. RESEARCH METHODOLOGY	16
1.6.1. Research design & approach	17
1.6.2. Research Method	18
1.6.2.1. Literature review	18
1.6.2.2. Research participants	19
1.6.2.3. Measuring instruments	19
1.6.2.4. Research procedure	20
1.6.2.5. Statistical analysis	20
1.6.2.6. Managerial implications of the research	21
1.6.2.7. Ethical considerations	21
1.7. LIMITATIONS OF THE STUDY	22
1.8. CONTRIBUTION OF THIS STUDY	22
1.9. LAYOUT OF THE STUDY & CHAPTER DIVISION	22
1.10. CHAPTER SUMMARY	23

<u>CHAPTER TWO</u>	<u>LITERATURE REVIEW</u>	24
2.1.	INTRODUCTION	24
2.2.	GENDER OR SEX INEQUALITY	25
2.2.1.	Sex vs Gender terminology explained	25
2.2.2.	Gender and/or sex differences in the workplace & impact thereof	26
2.2.3.	Conclusion	29
2.3.	OVERVIEW OF MINING LEGISLATION PERTAINING TO WOMEN	30
2.3.1.	South African Legislation	30
2.3.2.	Global Legislation	43
2.3.3.	Conclusions	44
2.4.	PERSPECTIVES AND TRENDS (SA & Global)	44
2.4.1	Conclusions	49
2.5	CHAPTER SUMMARY	49
<u>CHAPTER THREE:</u>	<u>DESCRIPTIVES AND FREQUENCIES</u>	51
3.1.	INTRODUCTION	51
3.2.	RESEARCH METHODOLOGY	53
3.2.1.	Target population	53
3.2.2.	Sampling	53
3.2.3.	Method of data gathering	54
3.3.	RESEARCH DESIGN	54
3.3.1.	Research Approach	54
3.3.2.	Instrumentation	55
3.3.3.	Research process	55
3.4.	SAMPLING	55
3.5.	DATA COLLECTION	56
3.6.	BIOGRAPHICAL INFORMATION	56
3.6.1.	Province working in	57
3.6.2.	Mining sector	58
3.6.3.	Open pit and Deep mining/ underground mine	59
3.6.4.	Place of work on mines	60
3.6.5.	Race	62

3.6.6.	Union affiliation	63
3.7.	CODING	64
3.8.	DESCRIPTIVE STATISTICS AND FREQUENCIES	65
3.9.	CHAPTER SUMMARY	73
<u>CHAPTER FOUR:</u>	<u>STATISTICAL DATA ANALYSIS</u>	76
4.1.	INTRODUCTION	76
4.2.	FACTOR ANALYSIS	77
4.2.1.	Correlation Matrix: Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity	77
4.2.2.	Communalities	78
4.2.3.	Total Variance Explained	80
4.2.4.	Scree Plot: Eigenvalue against Component Number	81
4.2.5.	Pattern Matrix	82
4.3.	RELIABILITY AND VALIDITY	85
4.3.1.	Reliability of factors	86
4.3.2.	Reliability of data	86
4.3.3.	Scale Statistics for Reliability testing	89
4.4.	CORRELATION ANALYSIS BETWEEN FACTORS	90
4.5.	COMPARISON WITH BIOGRAPHICAL VARIABLES	93
4.5.1	Independent Samples t-Tests	96
4.6.	CHAPTER SUMMARY AND CONCLUSIONS	100
<u>CHAPTER 5:</u>	<u>CONCLUSIONS AND RECOMMENDATIONS</u>	104
5.1.	INTRODUCTION	104
5.2.	RESEARCH PROBLEM & OBJECTIVES	104
5.3.	CONCLUSIONS AND RECOMMENDATIONS	106
5.4.	RECOMMENDATIONS FOR FUTURE RESEARCH	110
5.5.	SUMMARY OF RESEARCH STUDY	110
BIBLIOGRAPHY		112

ANNEXURES:

Annexure 1:	Extract from the Amendment of the Broad-based Socio-economic Empowerment Charter for the South African Mining and Minerals Industry.	118
Annexure 2:	Extract from the Reviewed Broad Based Black-Economic Empowerment Charter for the South African Mining and Minerals Industry, 2016: Publication of and invitation to comment on the Draft 39933	120
Annexure 3:	8th Annual Women in Mining Conference	122
Annexure 3a:	Letter of permission to conduct survey	123
Annexure 4:	Questionnaire	124
Annexure 5:	North-West University Statistic Consultation Service letter	129
Annexure 6:	Declaration of language editing	130
Annexure 7:	Letter of technical and typographical editing	131

LIST OF TABLES

	<u>Page Number</u>
<u>CHAPTER ONE:</u>	
Table 1.1: Measuring instruments per dimension construct	19
<u>CHAPTER THREE:</u>	
Table 3.1: Statements and statement codes	64
Table 3.2: Descriptive Statistics	66
Table 3.3: Percentage breakdown of participants' perceptions of women in the workplace in the SA mining industry	69
<u>CHAPTER FOUR:</u>	
Table 4.1: Measure for sampling adequacy and factor analysis	77
Table 4.2: Communalities	78
Table 4.3: Total Variance Explained	80
Table 4.4: Pattern matrix	83
Table 4.5: Cronbach's Alpha parameters	87
Table 4.6: Reliability Statistics	88
Table 4.7: Descriptive Statistics summary	89
Table 4.8: Correlation Matrix 1, Factors compared with each other	91
Table 4.9: Correlation matrix 2, Factors are compared against the category "other"	92
Table 4.10: Correlation matrix 3, Factors and "other" compared against relevant Bios	94
Table 4.11: T-Test Results based on Race	96
Table 4.12: Geographical dispersion at work	98
Table 4.13: Union affiliation	99

LIST OF FIGURES

	<u>Page Number</u>
<u>CHAPTER 1:</u>	
Figure 1.1: Score for the Broad-Based Socio-Economic Empowerment Charter for the South African Mining industry. Human Resource Development reporting template, 2010.	13
Figure 1.2: Score for the Broad-Based Socio-Economic Empowerment Charter for the South African Mining industry. Employment Equity reporting template, 2010.	13
<u>CHAPTER 2:</u>	
Figure 2.1: Distribution of mining rights that have been submitted by provinces (Source: SA,2015:11)	35
Figure 2.2: Full Shareholder and Economic Benefit to HDSA categorized by size (Source: SA, 2015:16)	35
Figure 2.3: HDSA representation at different employment functional categories (Source: SA, 2015: 27)	36
Figure 2.4: Scorecard: Reviewed Broad Based Black-Economic Empowerment Charter for the South African Mining and Minerals industry, 2016 (Source: SA, 2017b)	40
<u>CHAPTER 3:</u>	
Figure 3.1: Distribution of research participants by province in which they work	58
Figure 3.2: Distribution of research participants by mining sector	59
Figure 3.3: Distribution of research participants working in open pit and Deep mining/underground	60
Figure 3.4: Distribution of research participants by place of work	61
Figure 3.5: Distribution of research participants by race	62
Figure 3.6: Distribution of research participants pertaining to union affiliation	63
<u>CHAPTER 4:</u>	
Figure 4.1: Scree Plot	81

CHAPTER ONE

NATURE AND SCOPE OF THE STUDY

1.1. INTRODUCTION

In current times, many individuals speak of a male-dominated mining industry. Various speakers at the Annual Women in Mining Conference in SA in February 2017 continued to speak of gender imbalance in this particular industry.

Historically the mining industry was dominated by males in the workplace. This patriarchal approach was part of legislation as set out by many governments. Article 2 of the International Labour Organisation's Convention 45 of 1935 had forbidden women from participating in underground mining. The article clearly stated that "No female, whatever her age, shall be employed on underground work in any mine" (ILO, 2012). This regulation was also cited by Ian de Klerk in his Mini-dissertation on: The perceptions of the work environment of women in core mining activities (De Klerk, 2012).

The South African Minerals Act (Act no. 50 of 1991) also forbade women from engaging in underground work (Simango, 2006:15; SA, 1991). The Broad-Based Socio-Economic Empowerment Charter for the South African Mining and Minerals Industry, known as the Mining Charter, was introduced in 2002 as a tool to address the imbalances which existed in the mining industry. The Mining Charter required that mining houses comply to a total of 10% of their workforce being women by the year 2009, as compared to that of only 2% in 2000 (Mlambo, 2011). As captured in the Mine SA 2016 Facts and Figures Pocketbook (COM, 2016), the SA mining industry employed 457 698 people in 2016, and in 2015 the representation of women was at 18%, a total of 53 000 women, which means men still dominate this industry.

As much as the Mining Charter makes provision for women to work underground and on the surface, only a small percentage of women are employed in the mining industry. Employing women proves to be challenging, because mining houses are generally resistant to include women in their workplace, due to women having special needs which mines are unable to accommodate. Such needs include suitable toilet facilities, change rooms, as well as protective gear which is suitable for a women's body. Male counterparts use the traditional one-piece

overall, and such protective gear present a challenge for females as they need to remove the entire suit to use the toilet (Mlambo, 2011). In addition to this, women struggle to work in the extremely high temperatures underground at which men can work (Mlambo, 2011).

In an article entitled “Women in mining face challenges”, the author mentions that the issue of “personal protective equipment specifically designed for women is still an issue, specifically for women underground. However, sexual harassment, in various forms, can be a very real problem, for both women working underground and women in the boardrooms” (Ntombela, 2014:31). Another challenge which the mining industry faces is the inadequate and unsuitable housing facilities which they provide for their workers (Mashiane, 2009:3). In some instances, women’s accommodation is closely located to that of male workers, or both share the same accommodation block. Hence women’s privacy and safety are compromised.

“The achievement of gender equality in the male-dominated mining sector remains one of the biggest equity challenges in the country, and numerous problems accompany the deployment of women in core mining activities” Botha and Cronje (2015:10). At the 6th Annual Women in Mining Conference in 2015, one of the speakers highlighted that “women continue to be compensated significantly less than men in the same positions” (Senkhane, 2015:10). This may be perceived as an unfair practice and unethical behaviour on the part of any organisation. This practice is very demotivating to women and, in some cases, leads to high turnover intent.

In some cultures, there is a perception that women must have children early and/or all women must have children and women, therefore, cannot be professionals and so not belong in the working world. Women attain degree qualifications but once graduated they marry and have children (Campbell, 2007:8). This means that women may be promoted less often than men or even not sent on training and development courses due to the likelihood of their having children, a fact which is perceived as problematic by the mining industry. In light of this practice, these gender biased perceptions need to be examined. The Employment Equity Act (Act No. 55 of 1998), specifically for the mining industry, legislates that training opportunities are to be set more proactively for women. Section 100 (2) (a) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) provides for the establishment of the Mining Charter as a tool to influence transformation within South Africa (SA) with specific targets which include women’s development and promotion within the mining industry.

The Amendment of the Broad-Based Socio-Economic Empowerment Charter for the South African Mining and Minerals Industry, September 2010 (Mining Charter) (Anon., 2010) provides templates for mining houses to utilise in their reporting, which clearly shows females being considered for development and promotion to the various management levels within the mining industry. This is outlined in **Figures 1 and 2** below.

SCORECARD FOR THE BROAD-BASED SOCIO-ECONOMIC EMPOWERMENT CHARTER FOR THE SOUTH AFRICAN MINING INDUSTRY

CATEGORY: HUMAN RESOURCE DEVELOPMENT

DESCRIPTION	MEASURES	SPREAD OF MEASURE CATEGORY	REPORTING TEMPLATE						
			YEAR:						
			African		Coloured		Indian		White
			Male	Female	Male	Female	Male	Female	Female
Development of requisite skills, incl. support for South African based research and development initiatives intended to develop solutions in mining, processing, and exploration technology efficiency (energy and water use in mining), beneficiation as well as environmental conservation and rehabilitation.	HRD expenditure as percentage of total annual payroll (excl. mandatory skills development levy)	Learnership and Bursaries (of core and critical skills)							
		Artisans							
		ABET training (level I,II,III,IV and NQF 1)							
		Other training initiatives (school support & post matric programmes)							
		Support for South African based research and development initiatives							

Figure 1.1: Score for the Broad-Based Socio-Economic Empowerment Charter for the South African Mining industry. Human Resource Development reporting template, 2010.

SCORECARD FOR THE BROAD-BASED SOCIO-ECONOMIC EMPOWERMENT CHARTER FOR THE SOUTH AFRICAN MINING INDUSTRY

CATEGORY: EMPLOYMENT EQUITY

DESCRIPTION (ACTION)	MEASURE	REPORTING TEMPLATE						
		YEAR:						
		African		Coloured		Indian		White
		Male	Female	Male	Female	Male	Female	Female
Diversification of the workplace to reflect the country's demographics to attain competitiveness	Top management (Board level)							
	Senior Management (EXCO)							
	Middle Management							
	Junior Management							
	Core Skills							

Figure 1.2: Score for the Broad-Based Socio-Economic Empowerment Charter for the South African Mining industry. Employment Equity reporting template, 2010.

The Reviewed Mining Charter of 15 April 2016, **Annexure 2**, in terms of Employment Equity (EE) requires that at executive management board level companies must have a 15%

representation of black females with exercisable voting rights and 25% at directors level, 30% at senior management level, 38% at middle management level and 44% at junior management level. The Mining Charter is supposed to be used as a tool to guide mining houses on specific targets and to encourage. The question is: Are mining houses using the Mining Charter to drive this transformation or are they merely complying with its tenets?

As a result of the aforesaid background knowledge, the author would like to investigate females' perceptions of the workplace in the mining industry in SA and determine what improvements have been made during the last 15 years (since inception of the MPRDA in 2002 to current/ 2017) to accommodate women within the mining industry and how these improvements (if any) have impacted them.

1.2. PROBLEM STATEMENT

As much as legislation dictates that the mining industry must include and improve women's position in the industry, there are still ongoing issues which need to be changed. Such issues include sexual harassment, poor toilet facilities, an uncondusive work environment, unsuitable protective gear, unsuitable accommodation, and victimisation for having the potential to bear children which results in a lack of training; development and/ promotion. These are reasons why women may tend to feel demotivated, vulnerable and challenged in their workplace, which may lead to burnout and/or turnover intent. For this reason, it is important to investigate the perceptions of women in the workplace in the SA mining industry. Based on the outcome of this study, recommendations may be made to the mining industry on employment conditions that still need to be improved for women in the workplace and also recommendations may be made for future research.

1.3. RESEARCH QUESTIONS

The primary objective of this study is to determine the perceptions of women in the workplace in the SA mining industry and to understand their experiences better; to establish improvements, recommend changes and encourage transformation.

Secondary objectives are:

- To better understand what women working within the mining industry experience every day;
- To determine what the main problems are for women in the mining industry;
- To make the mining industry's management aware of the challenges women face in their workplace on a daily basis, so that these working conditions can be improved;
- To suggest improvements in the workplace of women working in the mining industry, through the Annual Women in Mining Conference, WIMSA (Women in mining South Africa), COM (Chamber of Mines) and DMR (Department of Minerals);
- To determine if mining is still considered a so-called "man's world";
- To do determine gender inequalities within the mining industry;
- To determine if there are salary discrepancies between male and females within the mining industry;
- To determine the psychological wellbeing of women in the workplace in the mining industry; and
- To determine turnover intention of the women in the mining industry;

This leads to the ***Primary Research question*** which is:

- What should be improved or changed in the SA mining industry to allow for women to increase and improve their presence and performance in the workplace?

1.4. OBJECTIVES OF THE STUDY

The research objectives include a primary objective as well as secondary objectives.

1.4.1. Primary objective

The primary objective of this research study is to gauge the perceptions of women in the workplace in the mining industry, specifically in SA and how these impact these women.

1.4.2. Secondary objectives

The specific objectives of this research are:

- To determine if women in the mining industry are still subject to:
 - sexual harassment,
 - poor toilet facilities,
 - an uncondusive work environment,
 - unsuitable protective gear,
 - lack of development and promotion,
 - victimisation for being child-bearing individuals; and
 - unsuitable accommodation,
 after legislation to address such challenges being continually passed over a period of 15 years.
- To determine if their working environment makes them feel:
 - demotivated;
 - vulnerable;
 - challenged in their workplace;
 - burnout;
 - turnover intent;
- To make recommendations to the mining industry to make improvements in women's working conditions; and
- To make recommendations for future research.

1.5. SCOPE OF STUDY

The study focuses on the SA mining industry and, in particular, on women who are employed in the SA mining industry and their perceptions of the workplace. Questionnaires were distributed to various women who are employed at various mining companies throughout SA. These women were targeted at the Annual Women in Mining Conference in February 2017.

1.6. RESEARCH METHODOLOGY

The empirical research seeks to gauge the perceptions of women of the mining industry in their workplace. It should also determine if they are exposed to sexual harassment, poor toilet

facilities, an uncondusive work environment, unsuitable protective gear, lack of development and promotion, victimisation for being child-bearing individuals and unsuitable accommodation, as constructs of this study. If the women in the mining industry are exposed to any of these constructs, it will further determine how they affect and impact these women.

Empirical research coupled with literature reviews will address the various aspects examined in this research topic. It should hypothesise that women in the mining industry are unfairly treated these multi-dimensional constructs, and some remedies need to be put in place to improve their workplace situation and the way they are treated.

1.6.1. Research design & approach

This study includes literature review and empirical study, with an aim to determine factors that influence the number of women in the mining industry in SA, and to identify possible solutions that may lead to an increase in the number of women in the workplace-specific to the mining industry. To achieve these aims a quantitative research methodology will be used.

The theory behind the positivist paradigm is that the objective truth exists in this world which may be measurable and scientifically explained. The quantitative method of research involves the measuring and counting of events, then performing a statistical analysis of the numerical data (Mashiane, 2009:52).

The strengths of quantitative research method are that it:

- Provides a specific statement of the research problem;
- Precisely specifies the independent variable and dependent variables;
- Gives a clear indication or path to follow to arrive at the objective;
- Provides high levels of reliability from the data obtained because of the controlled survey questionnaire;
- Reduces subjectivity of judgment;
- Allows for longitudinal measurement of subsequent performance of subjects;
- Offers an in-depth investigation of the phenomena;
- Is not limited to rigidly definable variables;
- Examines complex questions which may be challenging to investigate with quantitative research methods; and

- Provides a challenging questionnaire, which will assist in generating the findings of the study.

A cross-sectional study will be conducted, as it will be a study in one period (February 2017) with the full-time female employees in the mining industry in SA. Based on the primary data collected, descriptives and frequencies will be explained, followed by statistical data analysis which will comprise factor analysis; reliability and validity testing; correlation analysis between factors; and comparison with biographical variables. From this, conclusions will be drawn and recommendations will be made.

1.6.2. Research Method

1.6.2.1. Literature review

The purpose of the literature review is to obtain essential information to develop a questionnaire and also make recommendations.

In the literature study (Chapter 2) a complete review regarding the following constructs will be conducted: sexual harassment, poor toilet facilities, unconducive work environment, unsuitable protective gear, lack of development and promotion, victimisation for being child-bearing individuals and unsuitable accommodation. The sources that will be consulted include:

- Books;
- Ebooks;
- Research articles;
- Journals;
- Internet searches: Google Scholar;
- EBSCO and SABINET;
- Popular articles;
- Magazines; and
- Other relevant documents.

Information will be sourced from the North-West University library, Google Scholar, EBSCO and SABINET and other relevant bodies of knowledge

Key words include but are not limited to perceptions, perspectives, women, female, mining, mining industry, South Africa.

1.6.2.2. Research participants

“The target population is the population to which the researcher ideally would like to generalize his or her results” (Welman, *et al.* 2011). For this study, the population will be female employees who are employed on a full-time basis, and who are employed in the mines in South Africa. The target population was targeted through the Annual Women in Mining Conference on the 22 February 2017; see **Annexure 3, Annual Women in Mining Conference**. The researcher issued 200 questionnaires to the target population, with the intention of receiving 150 of the questionnaires back from this target population, to have a sample on which to work. The reason for this choice is to address the study.

1.6.2.3. Measuring instruments

To measure and explain the multi-dimensional construct, appropriate measuring instruments will assist in the determination of the objective of the study, indicating the rate of internal consistency and as outlined below.

The questionnaire is designed using the Five-point Likert scale as well as instruments as listed in **Table 1.1** below.

Table 1.1: Measuring instruments per dimension construct

Objective	Measuring Instrument	Source
Perceived unfairness including sexual harassment, poor toilet facilities, unconducive work environment, unsuitable protective gear, lack of development and promotion, victimisation for being childbearing and unsuitable accommodation, due to being	Chronic Work Gender Discrimination and Harassment (YES Study) scale	McNeilly et al. (1996) and Bobo & Suh (1995).

female (gender discrimination)		
Self-esteem	Rosenberg's Self-Esteem Scale	Rosenberg (1979)
Organisational commitment	Allen and Meyer's Commitment Scale	Allen & Meyer (1900)
Turnover intention	Sjöberg and Sverke' turnover scale	Sjöberg & Sverke (2000)

1.6.2.4. Research procedure

The literature study will be done initially and, once concluded, a questionnaire will be adapted from information attained through the literature study. The questionnaires will be distributed to the target population through the Annual Women in Mining Conference in February 2017. The researcher will issue about 200 questionnaires, with the intention of receiving 150 back as indicated in **Section 1.6.2.2.** above. The data is retrieved from the received questionnaires, and analysis is conducted. The combination of literature and empirical research will evolve into the research report which will generate findings and recommendations.

The process through which data will be collected is as follows:

All relevant stakeholders were engaged and briefed on the study before the issuing of the questionnaires. The survey will be conducted at the Annual Women in Mining Conference in February 2017 because the target population is large and logistically complicated. The questionnaires will be physically handed out in the form of hard copies to participants.

1.6.2.5. Statistical analysis

Statistical consultants from the North-West University were consulted to determine the accuracy of the information. The researcher interpreted the results thereof.

T-test with effect size approach will be used to establish significant practical differences. Cronbach's coefficients will be used to calculate each dimension, and those items of each factor

that reduce the total-item correlation will be eliminated and the higher coefficients obtained for each dimension. The use of multiple regression analysis to investigate whether the constructs predicts self-esteem, work performance and turnover intention. The reliability and significance of the instruments will be tested for consistency over the different situations. Cronbach's alpha will be used to test the reliability of the questionnaire. Correlations will examine any relationship between variables and establish a mutual factor. Descriptive statistics, such as frequencies, means and standard deviations, will use to describe the data.

1.6.2.6. Managerial implications of the research

The study will indicate to management in the mining industry the perceptions women have of their workplace experience, and further indicate that there is a need to improve working places for women based upon these perceptions.

The study will establish if there is a need to revisit legislation in SA which may be driven through the COM. It will show if change agents are necessary to change the perceptions of males and females in the workplace of the mining industry. It should also demonstrate how to treat fellow workers in order to eliminate discrimination in the workplace. It could suggest that mining management needs to deal more effectively with both the discrimination and workplace environment of women employees, and review and appropriately improve the code of conduct in the workplace.

1.6.2.7. Ethical considerations

Disclosure of relevant information is essential in this study, which will be in a covering letter distributed with the questionnaires. Participation is on a volunteering basis only. The questionnaire will not contain any leading questions. Questions will be constructed in such a way that it does not discriminate any persons. Anonymity will be preserved, as no names will be required.

In capturing the literature, plagiarism will be avoided, and authors will be given the recognition they deserve.

1.7. LIMITATIONS OF THE STUDY

A key limitation of the study is that the issue of women in mining in all aspects is under-researched in SA, which results in the researcher having access to few scientific sources. This study only focused on the women who attended the Annual Women in Mining Conference as questionnaires were distributed at the conference in February 2017; which may lead to results that exclude women who could not afford to attend the conference or who are excluded because their companies do not send them to such conferences. Hence it may not be reflective to all women the mining industry.

1.8. CONTRIBUTION OF THIS STUDY

The impact of the study is to bring new insight on the perceptions of women in the workplace in the SA mining industry. Not many studies have been concluded in SA on this topic, targeting women throughout SA. The study will assist mining houses to address challenges within their businesses, as the results could indicate in which areas the challenges are contained. The study will provide recommendations to help address the challenges.

1.9. LAYOUT OF THE STUDY & CHAPTER DIVISION

The study consists of five chapters which are presented as follows:

Chapter One - In Chapter One, an introduction will be provided, providing the purpose of the study, the current situation, some history which would then emanate into a problem statement, the objectives of the study, the research methodology, the study limitations and its contribution.

Chapter Two - In Chapter Two an introduction of the chapter will be followed by relevant terminology and an in-depth literature review which focuses on the various challenges faced by women in the mining industry. The Global and SA outlook will be dealt with, and then a summary of the chapter provided. This will provide the theoretical background and ideas for the research survey.

Chapter Three – In Chapter Three, the research methodology and design are discussed. Details on descriptives and frequencies are generated out of the empirical data which is explained. A summary is then concluded.

Chapter Four – Chapter Four covers the statistical data analysis emanating from the empirical data which is discussed in detail. The chapter closes with a summary.

Chapter Five – In Chapter Five, the Findings will be delineated, the Conclusions drawn and the Recommendations made.

1.10. CHAPTER SUMMARY

The chapter has provided an introduction to the study, followed by a problem statement, it then and further outlined the objectives and offered an outline of the study, the research methodology, study layout, limitations and contributions of the study.

Chapter 2 contains the Literature Study to back up the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. INTRODUCTION

In South Africa (SA) and globally, the mining industry over the decades has been a male-dominated industry and not generally preferred by women. The industry traditionally sourced males from rural areas to make up the labour workforce in SA. In the past, gendered roles were taken on by men and women were in the typical traditional type roles.

In SA, as mentioned in Chapter 1, the Department of Minerals (DMR) introduced the MPRDA (Mineral and Petroleum Resources Development Act (28 of 2002)) and the Mining Charter (Broad-Based Socio-economic Empowerment Charter for the South African Mining and Minerals Industry), in order to address the imbalances and rectify previous inequalities in the industry. This legislation required the inclusion of women in the mining industry.

As stated in the Abstract and Chapter 1, the objective of the study is to establish the perceptions of women in the workplace in the SA mining industry and to determine what changes have been made over the years to accommodate women and how these affect them. The study also examines other specific factors which influence women in mining in SA.

The theoretical framework of Chapter 2 covers the following:

- **GENDER OR SEX INEQUALITY**
 - Sex vs Gender terminology explained
 - Gender and/ sex differences in the workplace and the impact thereof
 - Conclusions
- **OVERVIEW OF MINING LEGISLATION WOMEN**
 - SA legislation
 - Global legislation
 - Conclusions
- **PERSPECTIVES AND TRENDS (SA & Global)**

- Conclusions
- **CHAPTER SUMMARY**

2.2. GENDER OR SEX INEQUALITY

The mining industry all over the world has been considered a masculine industry for many years. According to Jewkes *et al.* (2015:S113) masculinity as “a core element of the construction of hegemonic masculinity is heterosexual, and to a greater or lesser extent hegemonic masculinity is constructed as a gender position that is as much ‘not gay’ as it is ‘not female’.”

As much as the industry has been male/masculine dominated for several years, there has been legislation put in place to attempt to address this (see section 2.3 below), to bring women into the industry, and also to accommodate them. This section of the study will indicate if there are still inequalities among the genders, even though legislation dictates otherwise.

To better understand the topic of this study, a theoretical framework is provided in this section, on issues pertaining to gender and gender inequalities. Terminology is explained for the terms “sex” and “gender” in order to understand the difference between the two. Then gender and/ sex differences in the workplace and the impact of these differences will be captured so as to understand what women experience in the workplace and finally, a conclusion will be drawn from the literature reviewed in this chapter.

2.2.1. Sex vs Gender terminology explained:

Much research has been conducted in terms of sex role identities (SRIs) and gender. According to Bem (cited by Bernstein & Osman, 2016:2) there are four SRIs which include masculine, feminine, undifferentiated and the androgynous. However, Woodhill and Samuels (cited by Bernstein & Osman, 2016:4) propose seven categories for sex role identities, which include positive masculinity, negative masculinity, positive androgyny, negative androgyny, positive femininity, negative femininity and the undifferentiated identity.

Gender signifies the “characteristics taken on by men and women as they encounter social life and culture through socialisation (Wharton, 2006:6). This means that gender roles are

determined by one's religion, beliefs or culture in general; hence, they should be looked at as social structures and not the result of biological factors.

Connel (cited by Botha, 2013:27) defines gender as “the structure of social relations that centres on the reproductive arena, and the set of practices that bring reproductive distinctions between bodies into social processes”. Botha (2013:27) further states that gender “is not biologically pre-determined but refers to the economic, social and cultural attributes and opportunities associated with being male or female at a particular point in time,” and society.

From the above mentioned-definition, it is clear that there are many categories for SRIs and differences between “sex” and “gender”. “Sex” refers to either the state of being male or female when a person is born. While “gender”, refers to a social construct which is learned over time through socialisation from the time of birth and, after that, and which may change over time.

For this study, the following definition of ‘sex’ is used (Tischler as cited by Botha, 2013:26) “A person is born either male or female, and therefore it can be assumed that sex is an ascribed status,”. The terms ‘woman/women’ is used in this study to describe a person or persons who was/were born female in terms of sex (biological determination.)

2.2.2. Gender and/or sex differences in the workplace & impact thereof:

This study also seeks to establish if differences among the sexes/genders still exists in the mining industry in SA. Both SA and global literature are considered in this section. Women are excluded in the workplace in certain instances not because they lack the ability or qualifications to perform the job, but because there is a deliberate effort on the part of their male counterparts to exclude them. This could be because women's roles in social situations, such as being a secretary, were subordinate to their male counterparts in the past.

Indicated below is a review of literature which considers the **positive impact** women have in the workplace and hence in the mining industry as a whole.

- Women are certainly capable according to Bernstein and Volpe (2016:2) because they are more masculine or androgynous, have significantly more flexible coping styles, higher self-esteem, a greater level of achievement, motivation, resilience, subjective

feelings of well-being, improved self-concept, improved work performance and engagement, than men do. While women who are feminine or androgynous have a greater ability to harness and use social support and, thus, form strong networks in the workplace. Networks are generally difficult for women to break into, and they are generally unable to commit extra time out of work hours for networking due to their commitments at home (Mompei, 2016:29), yet they are able to form strong networks.

- Bernstein and Volpe (2016:9) also mention that the research which was conducted across nine studies in the SA Research Project over the past four decades (since 1976), found that “those [women] with positive identities report significantly lower perceptions of work stress” and “significantly higher psychological well-being, self-esteem” and “conflict resolution skills, emotional intelligence, work engagement and perceived organizational support and perceived insider status, as compared to those with negative identities” (see Bernstein & Osman, 2016).
- Another positive aspect for women in mining is as the mining industry in SA and globally moves into the future, it becomes increasingly clear that work will become more modernised, which will create more opportunities for women in the mining industry. As mining becomes more mechanised, motor skills, deftness and problem-solving skills are needed more than physical strength (SA, 2010a:3). This development then creates additional opportunities for women to enter the mining industry, which will also result in women contributing more to the economy, and also contributing both physically and intellectually to the mining industry.
- At the 6th Women in Mining Conference in 2015, Boninelli outlined factors which companies should adopt in order to attract women to the mining industry, of which training and development opportunities were a key factor, because these give women the opportunity to grow in their roles and thus contribute towards the improvement of the industry (Senkhane, 2015:10).
- The other benefit of greater gender equality is that of creating smarter economic systems which enhance productivity and improve development outcomes. It also includes superior quality societal and institutional policies and, consequently, a better vision for the next generation (Mompei, 2016:28).

The literature review presented below demonstrates the **negative impact** on the mining industry if women are not incorporated into the workplace.

- Women endure discrimination in the workplace in many aspects of employment, which include the type of jobs they attain, their remuneration and benefits, their working conditions and decision-making powers. Research has indicated that occupational and vertical segregation, gender pay-gaps, challenges in balancing family and work life, the number of women in part-time jobs, informal and unwarranted work, sexual harassment and discrimination constructed on marital status or maternity, all persist in spite of policy and legislative initiatives. As much as progress has been made, “women are still a long way from achieving gender equality in the labour market.” Discrimination in the workplace has deep social roots, which are not easily removed by legislation (ILO, 2011). At the 6th Women in Mining Conference in 2015, it was pointed out that in SA women who hold the same positions in the mining industry as men are compensated much less than their male counterparts (Senkhane, 2015:28).
- The majority of the literature reviewed verifies the challenges experienced by women when seeking to be integrated into the labour market in general. Salinas (2013:1835) indicates that “In Latin America, Chile has the lowest rate of female participation in the workforce - close to 40%, compared to 61% in Brazil, 59% in Peru and 56% in Colombia.”
- According to Heilman (cited by Bernstein & Osman 2016:1), in the world of research in the previous four decades, much attention has been given to sex role identity (SRI) and organizational well-being, which indicates that SRI, which relates to the sex role behaviour that individuals adopt as part of their gender identity, have implications for the future well-being of women.
- Olckers and Enslin (2016:125) found that the work environment fosters workplace trust which escalates the level of psychological ownership experienced by employees, and this, in turn, reduces employees’ turnover intentions. This finding indicates that negative work environments will increase the number of women leaving their jobs, resulting in the slower transformation of the mining industry. The mining industry certainly constitutes a negative work environment, because of the existence of issues such as discrimination in the workplace towards women, gender pay gaps, sexual harassment and prejudice due to marital status and/or maternity (see 2.4).
- In addition, the results of the study conducted by Els *et al.* (2011:11) confirmed that the moderating effect, suggested “**when bullied by supervisors**, a lack of POS (more specifically role clarity, participation in decision-making and supportive supervisory

relationships),” actually increase the victims’ tendency to leave an organisation. Male supervisors tend to ‘bully’ women in the workplace.

- In a journal article by Wiggins and Al-Obaidi (2013:1), reporting on women in the Middle East and North Africa (MENA), it is stated that in male-dominated societies women found themselves delimited by men exercising tribal, religious and/or traditional power. These men tend to think, act and make choices on behalf of women. The impact of this demoralising behaviour could result in wrong decision making by the women which undermine their position. The authors also identified that over “the last five decades, these typical practices of controlling women have further deepened the lines of segregation between men and women”.
- When women are in the minority in an organisation, or they are regarded as only holding token positions to satisfy legislation, they are treated differently to men. Crawford and Mills (2011:e100), also captured that, “regarding women progressing in organisations, ‘behaving like a man’ as a strategy for advancement is often used.” This strategy could backfire and work against a woman in the workplace as some women may segregate themselves from the woman who chose this strategy, or men may not welcome a woman who emulates them.
- Bell *et al.* (2016:3-26) concluded a survey on the Global Board of Directors in 2016. The survey received responses from over 4 000 directors, both male and female, from 60 countries. The study found that on average only 18% of women are board members. Older male directors report the “lack of qualified female candidates,” while “women directors most often cite the fact that diversity is not a priority in board recruiting and that traditional networks tend to be male-dominated.”, and “Boardroom diversity quotas are generally not supported overall because almost 75% of the surveyed directors do not support boardroom diversity quotas”. Ansfield (2016:2) states that “In a hyperconnected world, incremental improvement is not enough to stay ahead of disruptive competitors. Winning requires continual transformation”. Not having women in crucial roles can be detrimental to the industry.

2.2.3. Conclusion

The terminology relating to ‘sex’ and ‘gender’ and their various connotations have been explained in Section 2.2. above and includes the following definition of ‘sex’ by Tischler (cited by Botha, 2013:26) “a person is born either male or female and, therefore, it can be assumed that

sex is an *ascribed* status.” The definition of the term “women” and/ “female” in this study will be ‘a person who was born female in terms of sex (biological determination)’, and will also include heterosexual, homosexual, or bisexual individuals regardless of their sexual orientation.

Various forms of legislation have been introduced to improve women’s position in mining and in the workplace in general, however, there are still many gaps and these have caused in both negative and positive consequences for women in the industry.

2.3. OVERVIEW OF MINING LEGISLATION PERTAINING TO WOMEN

Throughout the world over the past decades mining jobs have not been desired as an occupation by women nor easily awarded to women. Traditionally the mining industry was patriarchal; however, significant developments in mining legislation have taken place over the past few years.

The previous section provided information on gender inequality, while this section will cover legislation pertaining specifically to women in the mining industry.

2.3.1. South African Legislation:

This section provides the legislative framework for gender (women) transformation in the SA mining industry only. It demonstrates initiatives undertaken by the SA government to redress injustices of the past in order to promote equality in the SA mining industry. Specific reference is made to legislation pertaining to women in this industry.

It should be noted that “The Mines and Works Act no. 12 of 1911 was repealed by the Mines and Works Act No. 27 of 1956, and after that, Act No. 27 of 1956 was repealed by the Minerals Act No 50 of 1991” (Mine Health and Safety Council, 2017).

In terms of Section 11 (1) of the Mines and Works Act (27 of 1956), “No male person under the age of sixteen years and no female shall work, and no person shall cause or permit any male person apparently under the age of sixteen years or any female to work, underground in any mine” (Union of SA, 1956:61). This legislation meant that, until it was replaced in 1991, women were prohibited from working underground.

The Mines and Works Act (27 of 1956) was later replaced by the Minerals Act (50 of 1991) which allowed women to work underground as per Section 32 (2) and as indicated below:

“(2) No female shall work underground in the mine, and nobody shall cause or permit any such female so to work except-

- (a) females holding positions of management and who do not perform manual work;
- (b) females employed in health and welfare services;
- (c) females who, in the course of their studies, have to spend a period underground in the mine for training or research purposes; or
- (d) any other females who may occasionally have to go underground in a mine for the purposes of non-manual occupation” (SA, 1956:55).

According to the Pan African Resources PLC (2017) “The legal tenure of mineral properties within South Africa is governed by the MPRDA. The effective date of which this legislation came into effect and replaced previously applicable legislation (the Minerals Act 50, of 1991) is 1 May 2004.” The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) which is better known as the MPRDA regulates the following objectives women:

“2. The objectives of this Act are to ...

- (c) to promote equitable access to the nation’s mineral and petroleum resources to all the people of South Africa,
- (d) substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation’s mineral and petroleum resources” (SA, 2002:18).

To give rise to Section 100 (2) (a) of the MPRDA, “In 2002, the Department of Minerals and Energy (DME) introduced the Broad-Based Socio-economic Empowerment Charter for South Africa’s Mining Industry” (Fauconnier & Mathur-Helm (2008:4), which is better known as the Mining Charter in the industry. This legislation was then followed by the Scorecard (Notice 1639 of 2004), which was “intended to “reflect the “spirit” of the Broad-based Socio-Economic Empowerment Charter for the Mining Industry” as stated in the introduction, and in Section 2 the interpretation of Historically Disadvantaged South Africans (HDSA) refers to “any person, category of persons or community, disadvantaged by unfair discrimination before the introduction of the Constitution of the Republic of South Africa, 1993 (Act No. 200 of 1993) came into operation” (SA, 2004:8). The MPRDA was not specific on the definition and

placement of women in the mining industry, however, it may be assumed that women fall into the HDSA category by definition. Regarding the Section 4 of the Scorecard for the Broad-based socio-economic empowerment charter for the South African mining industry (Notice 1639 of 2004), mining houses were required to implement the following actions pertaining to women:

- *Section 4.1, Human Resource Development:* “implement career paths to provide opportunities to their HDSA employees to progress in their chosen careers” (SA, 2004:10),
- *Section 4.2, Employment Equity:*
 - “40 percent HDSA participation in management”,
 - “Identification of a talent pool and fast-tracking it. This fast-tracking should include high-quality operational exposure;” and
 - “Ensuring higher levels of inclusiveness and advancement of women. The stakeholders aspire to a baseline of 10 percent of women participation in the mining industry within 5-years;” (SA, 2004:11).

In 2009, the DMR conducted an impact assessment to establish the progress in the SA mining industry regarding the objectives of the Mining Charter and generated the DMR’s Mining Charter Impact Assessment Report (SA, 2009). The findings of the report showed that as much as the Mining Charter is a valuable tool for improving transformation in SA’s mining industry, there are challenges in the effective implementation thereof, in order to meet the its objectives.

In Section 3 of the DMR’s Mining Charter Impact Assessment Report (SA, 2009) the following results pertaining to women in mining were recorded:

- *Section 3.1, Human Resource Development:* In terms of career pathing, only an “average of 17.1 percent was achieved.” (SA, 2009:5).
- *Section 3.2, Employment Equity, HDSA participation in management:* “An average of 26 percent of mining companies achieved a threshold of 40 percent of HDSA participation at management level.” This figure is 14 percent below the 40 percent as set out in the Mining Charter (SA, 2009:6).
- *Section 3.2, Employment Equity, Talent pool identification and fast tracking:* It was found that 83 percent of mining houses did not identify employees for the talent pool requirements (SA, 2009:8).
- *Section 3.2, Employment Equity, Women participation in mining:* In terms of the Mining Charter requirement of “10 percent of women participation in the mining industry”, the

impact assessment found that this had been reached, however, it included White women. The report also indicated that there was an insignificant number of HDSA employees in decision making roles, while many occupied middle management roles. The impact assessment also found that 26 percent of mining houses actually complied with the 10 percent women in mining participation requirement. The DMR's Mining Charter Impact Assessment Report (SA, 2009) indicated further that the "average rate of women participation is 6 percent, the bulk of whom are represented in support functions with less than 1 percent in core management positions" (and mostly White women) (SA, 2009:8).

- *Section 3.9, Ownership and Joint Ventures:* Analysis also indicated that BEE ownership in the industry reached 9 percent against the required 15 percent. One of the empowerment vehicles which constitute BEE ownership is the inclusion of women in mining (SA, 2009:17).

The DMR's Mining Charter Impact Assessment Report (DMR, 2009), Section 5 (SA, 2009:22) concluded and made the following recommendations in terms of women in mining:

- *Section 5, HDSA's in Management (including women in mining):* Mining houses frequently employed HDSA employees in support service roles as opposed to core roles. They also found that core roles were occupied by White SA men and women. It was recommended that the composition of HDSA personnel be given specific attention (SA, 2009:24).
- *Section 5, Human Resources Development:* It was found that the SA labour market does not have sufficient people with the skills required to achieve sustained growth in the mining industry. The report suggests that the Research and Development criteria as outlined in Mining Charter be given special attention to address this shortfall (SA, 2009:24).
- *Section 5, Ownership:* The report found that the definition of participation in terms of ownership was unclear and this ambiguity left room for different interpretations. This confusion resulted in only 9% BEE ownership (including that by women) being achieved (SA, 2009:24).

As outlined in the recommendations of the DMR's Mining Charter Impact Assessment Report (SA, 2009), the appraisal indicated that the Mining Charter remains relevant for implementing meaningful transformation in SA, however, due to the identified shortcomings it was not fully

effective as an instrument for promoting transformation. It was then recommended that the Mining Charter is reviewed and strengthened. This resulted in the Amendment of the Broad-based Socio-economic Empowerment Charter for the South African Mining and Minerals Industry (SA, 2010a), which was launched in September 2010.

In terms of Section 2.1 - Ownership of the amended Mining Charter, in order to achieve a “substantial change in racial and gender disparities prevalent to ownership”, mining houses were required to achieve a minimum of 26 percent HDSA ownership by 2014 (SA, 2010a:2).

While Section 2.4 - Employment Equity of the amended Mining Charter, required that all mining houses must attain a minimum of 40% HDSA in the employment functional categories of Executive Management (Board), Senior Management (EXCO), Middle Management and Junior Management, as well as in Core and Critical Skills by 2014 (SA, 2010a:3).

In order for a mining house to gain a mining right, as a requirement of the provisions of Section 23 of the MPRDA, a mining house must submit a Social and Labour Plan (SLP) to the DMR. The SLP must indicate the plan to achieve targets set out in the Mining Charter in terms of the following elements: Ownership, Human Resource Development, Employment Equity, Mine Community Development, Housing and Living Conditions, Procurement, Measures to ameliorate the impact of Downscaling & Retrenchments, Financial Provision, and Monitoring, Evaluation & Reporting (SA, 2010b:4). The Revised SLP Guidelines (SA, 2010b) published in 2010, intended to aid mining houses with an application for mining rights in preparing SLPs. This guideline factored in ‘Female’ into certain templates for submission of SLP and compliance thereof. This forced mining houses to plan the intake of women into Mentorship programmes, as well as Employment Equity plans.

The DMR conducted a second assessment on the Mining Charter and compiled a report in 2015. This report, the “Assessment of the Broad-based Socio-economic Empowerment Charter for the South African Mining and Minerals Industry (Mining Charter), May 2015”, presented “the findings of the assessment of implementation of the Mining Charter against each element, effectively quantifying progress of implementation of the instrument in an aggregated manner over a ten-year window period.” (SA, 2015:5). The web-based assessment was conducted on 375 (380 Active – 8 Closed) mining companies as indicated in **Figure 2.1** below for distribution of mining rights that were submitted by the nine provinces in SA. (SA, 2015:6)

Province	Total Number of mining rights			Total Number of rights
	Active	Care and Maintenance	Closed	
Gauteng	55	11	0	66
North West	48	13	0	61
Limpopo	24	5	1	30
Northern Cape	42	6	0	48
KwaZulu-Natal	42	3	3	48
Mpumalanga	61	6	1	68
Free State	24	1	0	25
Western Cape	59	5	2	66
Eastern Cape	25	4	1	30
Total	380	54	8	442

Figure 2.1: Distribution of mining rights that have been submitted by provinces

(Source: SA, 2015:11)

In terms of Ownership pertaining to HDSA (including women), it was reported that as many as 79% of large-right holders met or exceeded the 26 percent HDSA Ownership target, with an average of 26.2% amongst large-right holders, 64% had transferred Economic Benefit between 0 - 26%. However, 29% had accrued no (0%) Economic Benefit. For medium-right holders and small-right holders, 55% and 71% of HDSA partners respectively had not accrued any Economic Benefit at all (DMR, 2015:16). The **Figure 2.2.** below, as extracted from the report, indicates the HDSA Shareholder Credits and Economic Benefit.

HDSA Shareholder Credits			
HDSA Ownership	Rights size by employment		
	Large	Medium	Small
<26%	21%	17%	25%
≥26%	79%	83%	75%
Economic Benefit to HDSA			
Economic Benefit to HDSA	Rights size by employment		
	Large	Medium	Small
0%	29%	55%	71%
Between 0% - 26%	35%	20%	21%
≥26%	36%	25%	8%

Figure 2.2.: Full Shareholder and Economic Benefit to HDSA categorised by size

(Source: SA, 2015:16)

Section 4.5, on Employment Equity, contains the following analysis of the findings of the Mining Charter Report for 2015, as detailed in **Figure 2.3** below.

Category	African		Coloured		Asian (Indian and Chinese)		White		Foreign Nationals		Total HDSA
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Top Management (Board)	32.0%	9.4%	3.9%	1.5%	2.8%	1.1%	37.4%	3.4%	8.5%	0.0%	54.1%
Senior Management (EXCO)	29.1%	5.2%	3.8%	0.7%	4.1%	2.1%	49.3%	5.7%	0.0%	0.0%	50.7%
Middle Management	26.3%	8.6%	4.4%	1.0%	2.1%	0.9%	45.1%	9.4%	1.8%	0.3%	52.7%
Junior Management	41.9%	9.0%	5.0%	1.0%	0.6%	0.2%	33.1%	5.1%	4.0%	0.1%	62.8%
Core Skills	64.1%	8.6%	1.7%	0.3%	0.1%	0.0%	6.1%	0.4%	18.2%	0.4%	75.2%
EAP Levels are: African Males (40%), African Females (35%), Coloured Males (6%), Coloured Females (5%), Asian Males (2%), Asian Females (1%), White Males (6%), and White Females (5%)											

Figure 2.3: HDSA representation at different employment functional categories
(Source: SA, 2015: 27)

From the Figure 2.3 above it can be seen that all the HDSA targets at the various levels exceeded the 40% target for 2014. However the figures for Female are low in each employment functional categories. For Top Management (Board) level, of the 54.1%, only 15.4% were SA women. At Senior Management (EXCO) level of the 50.7% HDSA, only 13.7% were women. At Middle Management level 19.9% were SA women of the 52.7%. At Junior Management level, of the 62.8% HDSAs, only 15.3% were SA women. Regarding Core Skills, 9.3% of the 75.2% were SA women.

Taking into account participation of the Economically Active Population (EAP) in the designated employment functional categories, African women are noticeably under-represented in each category, Coloured women are also significantly under-represented in all categories. While Asian women are noticeably over-represented at Board level and Senior Management level, but under-represented in all other categories. White women are noticeably over-represented in each category except for at Board level and Core Skills. Males dominate in all categories. The percentage of women participating in mining improved from 6% in 2009 to 10.5% in 2014. Much

work needs to be still done by the industry and government for women to be represented fully in the mining industry (SA,2015:27).

The previous assessment of the implementation of the Mining Charter (2010) indicated that there were low levels of development in career pathing and mentoring of HDSAs. The amended Mining Charter (2010) required mining houses to spend 5% of total payroll on development by 2014. This sum must exclude skills development levies. The report concluded that a significant number of mining houses (right holders specifically) had fallen below the mandatory threshold. It goes on the state that, “It should be noted that 2.8% of mining right holders reported HRD [human resource development] expenditure greater than total payroll, which could be an overstatement” (SA, 2015:30). This means that less is being invested in development for women.

The conclusions of the **assessment of the Mining Charter 2015** reports the following:

- Section 5, Ownership: “The assessment revealed that whilst a significant number of right holders, irrespective of size by employment, have reported having met or exceeded the 26% HDSA Ownership threshold, the meaningfulness of economic participation remains largely elusive” (SA, 2015:37); this means that fewer women are partaking in or being considered for Ownership.
- Section 5, Employment Equity: “From this assessment, it is evident that white males still dominate most of the key employment functional categories, especially Senior and Middle Management. Furthermore, data shows that African women are under-represented at all levels and more still needs to be done to improve their empowerment in the industry” (SA, 2015:39); and
- Section 5, Human Resource Development: “shows that most of the right holders have not met the target of spending 5% of their annual payroll on skills development.” (SA, 2015:39), this means fewer skills and HRD for women in the industry as well.

On 15 June 2017, the Reviewed Broad-based Black-Economic Empowerment Charter for the South African Mining and Minerals Industry, 2016 (Reviewed Mining Charter) was published. This document was the result of the 2014 - 2015 assessment of the Mining Charter and its findings.

In the Reviewed Mining Charter, the term HDSA and its definition have been removed and the term “Black Person” and its definition has been introduced, as indicated below:

“Black Person” is a generic term which means Africans, Coloureds and Indians who -

- (a) are citizens of the Republic of South Africa by birth or descent; or
- (b) became citizens of the Republic of South Africa by naturalisation:
 - (i) before 27 April 1994; or
 - (ii) on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation before that date;
- (c) are a juristic person who is managed and controlled by person/s described in paragraph (a) and /or (b) and the person/s collectively or as a group own and control all issued share capital or members' interest, and are able to control the majority of the members' vote;” (SA, 2017b:2).

This definition now excludes White women and includes the African, Coloured and Indian women of SA, and thus represents the majority of women in SA.

The Reviewed Mining Charter requires the following regarding the **Ownership Element** and as outlined in Section 2.1, includes “Black Person” which includes women in the industry:

- For new prospecting and mining rights holders:
 - “ 2.1.1.1. A Holder of a new prospecting right must have a minimum of 50% + 1 Black Person shareholding, which shareholding shall include voting rights, per prospecting right or in the company which holds the right.
 - 2.1.1.2. A Holder of a new mining right must have a minimum of 30% Black Person shareholding which shall include economic interest plus a corresponding percentage of voting rights, per right or in the mining company which holds the right” (SA, 2017b:7).
- For Existing prospecting and mining rights’ holders:
 - “2.1.2.3 A Holder who claims the recognition of Historical BEE Transactions is required to ‘Top Up’ its Black Person shareholding from the existing level to a minimum of 30% Black Person shareholding, at the Holder level within the twelve (12) months transitional period. Such Top Up need not be in proportion to the shareholding distribution set out in paragraph 2.1.1.3 above.

2.1.2.4 An existing Holder, who after the coming into operation of the Mining Charter of 2017, has maintained a minimum of 26% Black Person shareholding shall be required to Top Up its Black Person shareholding to a minimum of 30% within the twelve (12) months transitional period. Such Top Up need not be in proportion to the shareholding distribution set out in paragraph 2.1.1.3 above” (SA, 2017b:10).

The increase in the ownership element means that women would also be an included category and this would improve women’s participation in the mining industry as well.

In terms of the **Employment Equity element** for the inclusion of women and as outlined in Section 2.3, and indicated below, the Reviewed Mining Charter requires:

“Board

A minimum of 50% Black Persons with exercisable voting rights, 25% of which must be female Black Persons.

Executive /Top Management

A minimum of 50% Black Persons at the Executive Directors' level as a percentage of all Executive Directors, 25% of which must be female Black Persons.

Senior Management

A minimum of 60% Black Persons in Senior Management, 30% of which must be female Black Persons.

Middle Management level

A minimum of 75% of Black Persons in Middle Management, 38% of which must be female Black Persons.

Junior Management level

A minimum of 88% Black Employees in Junior Management, 44% of which must be female Black Persons.

Employees with disabilities

A minimum of 3% employees with disabilities as a percentage of all employees, reflective of national and/or provincial demographics.

Core and Critical skills

A Holder must ensure that a minimum of 60% Black Persons are represented in the Holder's Core and Critical Skills category by diversifying its existing pools. Core and Critical Skills must include technical representation across all organisational levels” (SA, 2017b:16).

Further to this in Section 2.16, a Scorecard is outlined, and it explicitly makes provision for “Black Females” at each organisational level, as shown below.

Element Description			Compliance Target %	Weighting %
Board:				
Africans	Coloureds	Indians	50%	3%
Black Females as a percentage of all Board representatives			25%	3%
Executive/ Top Management				
Africans	Coloureds	Indians	50%	3%
Black Females as a percentage of all executive directors.			25%	3%
Senior Management:				
Africans	Coloureds	Indians	60%	4%
Black Females as a percentage of all senior managers.			30%	4%
Middle Management:				
Africans	Coloureds	Indians	75%	3%
Black Females as a percentage of all middle managers.			38%	3%
Junior Management:				
Africans	Coloureds	Indians	88%	1%

7

Figure 2.4: Scorecard: Reviewed Broad Based Black-Economic Empowerment Charter for the South African Mining and Minerals industry, 2016 (Source: SA, 2017b)

With the new requirements as set out in the Reviewed Mining Charter, the percentage of women participating in the industry could increase drastically, because figures indicated in the 2015 Assessment Report showed a small increase from 6% in 2009 to 10.5% in 2014.

In terms of Career Progression, Section 2.3. also states that:

“A Holder must develop and implement a Career Progression Plan consistent with the Demographics of the Republic by:

- (a) Developing career development matrices of each discipline (inclusive of minimum entry requirements and timeframes);
- (b) Developing individual development plans for employees;
- (c) Identifying a talent pool to be fast-tracked in line with the needs; and
- (d) Providing a comprehensive plan with targets, timeframes and how the plan will be implemented.

The targets indicated under this element may change to address Employment Equity measures” (SA, 2017b:17).

This would mean further development and empowerment for women in the industry as well if companies comply with the career progression requirements.

The **Human Resource Development element** of the Reviewed Mining Charter requires the following in Section 2.4:

“A Holder must invest 5% of the Leviable amount on essential skills development. To achieve this objective, a Holder must invest the 5% in the following manner:

- (a) 2% on essential skills development activities such as artisanal training, bursaries, literacy and numeracy skills for employees and non -employees (community members);
- (b) The skilling referred to in paragraph (a) must be a representative of national and/or provincial demographics and must be biased towards low-level employees;
- (c) 1% towards South African Historically Black Academic Institutions for research and development initiatives intended to develop solutions in exploration, mining, processing, technology efficiency (energy and water use in mining), beneficiation as well as environmental conservation and rehabilitation. A Holder may make representations to the Minister for exemption from the 1% referred to in this paragraph (c) if the Holder has partnered and supported a State-owned entity in respect of mining-related research and development; and

(d) 2% towards the Mining Transformation and Development Agency” (SA, 2017b:18).

In the Reviewed Mining Charter, the HRD element is more structured to achieve overall development for employees and community members. This could mean for women that they will now be awarded artisanal training and bursaries to uplift themselves and seek employment in the industry, thus growing the percentage of participating women. This also means that women could be factored in the 2% set aside towards Mining Transformation and Development Agency.

As much as the Reviewed Mining Charter makes great strides towards improvements for and inclusiveness of women in the SA mining industry, there is much controversy around the new Mining Charter.

In an online news article, Dlodla (2017) mentioned that the Chamber of Mines (COM) rejected the Reviewed Mining Charter, stating that there were no meaningful consultations by the DMR prior to the introduction of certain items in the Reviewed Mining Charter, hence the COM would approach the court for an interdict for the implementation of the Reviewed Mining Charter. On the other hand, the National Union of Mineworkers (NUM) welcomed the Reviewed Mining Charter, as they appreciated the increased requirement for the BEE shareholding.

On 26 June 2017, the COM applied to the Gauteng Divisional High Court for an interdict to stop the implementation of the Reviewed Mining Charter. As much as the COM supports transformation, it noted that if the Reviewed Mining Charter is implemented, it would “destroy the very industry whose survival is necessary to give effect to the objects of the MPRDA”. The COM also requested for the matter to be urgently resolved in order to restore confidence in the industry (Anon., 2017a).

On the 14 July 2017, the COM said that the Mineral Resources Minister had “given a written undertaking that his Department will not implement or apply the provisions of the Mining Charter in any way, pending judgment in an urgent interdict application brought by the industry” (Anon., 2017b).

NUM was “shocked” and “disappointed” by the temporary suspension of the controversial Reviewed Mining Charter pending the outcome of the Chamber of Mine’s urgent interdict,

saying that it would be exploring legal possibilities in a bid to challenge it (Anon., 2017c). NUM further stated that it would consult their legal unit to challenge the court order between COM and DMR as transformation in the industry affects all employees and communities. NUM appealed the DMR to “‘stop tip-toeing’ around transformation and its constitutional obligations of redressing the imbalances of the past” (Anon., 2017c).

Depending on the outcomes from the courts and taking into consideration the COM, DMR and NUM positions on the implementation of the Reviewed Mining Charter, this result could again impact the women in mining regarding ownership, job level status and development.

2.3.2. Global Legislation

This section attempts to provide the background for global legislative together with an overview of female discrimination and transformation in the mining industry.

There is no global legislation specifically pertaining to women in the mining industry because each country has its own legislation. However, the International Labour Organisation (ILO) is a tripartite agency formed by the League of Nations in 1919 which “brings together governments, employers and workers’ representatives of 187 member states, to set labour standards, develop policies and devise programmes promoting decent work for all women and men.”, as per the purpose stipulated on their website (ILO, 2017).

Hence, the best way to capture this information is by reviewing the latest IOL 2011 report on “Equity at work: The continuing challenge” because it pertains to global equity. The report mentions that there is continual legislation, repeated institutional initiatives and a growing awareness for the need to overcome discrimination in the workplace; however, the political climate and economic downturn experienced in recent years has aggravated structural discrimination. Furthermore, discrimination in the workplace is continuously diversifying which results in new challenges while old ones are only partially addressed. “Race and sex continue to be the two grounds of discrimination which are specifically included in almost all legislation for equality and abolition of discrimination at work” (ILO, 2011:x). Worldwide, new laws were introduced and existing legislation amended to abolish discrimination based on maternity, marital status, lifestyle and genetic predisposition, and new policies introduced for training and improving employment quotas for women in managerial positions.; However, the benefits for

women are not enough, although these policies have been implemented, they are not functioning effectively because many institutions have a shortage of financial and human resources as well as insufficient policy coherence at local and national levels. Labour authorities, such as inspectors and public officials, lack knowledge and institutional capacity when addressing discrimination cases, which prevents victims of discrimination submitting claims (ILO, 2011:x).

“Although the ILO has had a Convention in place since 1935 prohibiting the employment of women in underground mining work (Convention 54 of 1935), many countries that initially ratified it have since ‘denounced’ this particular Convention. These countries include Australia (1988), Canada (1978), Chile (1997) and South Africa (1996)” (SA, 2017a:1).

2.3.3. Conclusions:

As recorded in the Mine SA 2016 Facts and Figures Pocketbook (COM, 2016:27), since the promulgation of the 2002 MPRDA and 2004 Mining Charter, the number of women in the mining industry has significantly increased from the targeted 10% by 2009 to 18% by 2015. However, this is still a low percentage, and with the Reviewed Mining Charter, this figure could increase drastically once the decision to implement it is taken by the high court (that is if it is allowed to be implemented as is). While the ILO 2011 report clearly captures that while some progressive policies are being implemented; these are insufficient to improve women’s inclusivity in the workplace or to prevent their discrimination.

2.4. PERSPECTIVES AND TRENDS (SA & Global)

For centuries, women have been working in the mining industry all over the world, whether on surface or underground to a lesser extent in more recently. Mining has for many centuries been a patriarchal occupation due to the type of work associated with this industry which generally made mining an unpopular career choice for many women.

In the previous sections, information was provided on gender inequality and mining legislation pertaining to women, to demonstrate gender inequality in the mining industry and the improvements made to SA legislation surrounding issues pertaining to women in the industry, This section provides a literature review of the perspectives and trends of women in the mining

industry both in SA and globally. **This review enables the researcher to understand better the variables which impact women employees within the mining industry.**

The following are perceptions and trends in the mining industry.

- ***Women working underground:*** The challenges faced by women who work underground include the risk of sexual harassment, rape, physical attack or assault, being verbally abused by male counterparts or allocated junior roles compared to their male counterparts. Personal protective equipment, such as overalls and boots, are generally designed for men and, thus, are not appropriate for women, there is a lack of decent toilet facilities because too few women work underground. Most women do not possess the same physical strength as their male counterparts. Pregnant women are not allowed to work underground during pregnancy or while breastfeeding. (SA, 2017a:3).

To address these challenges and to make it more attractive for women to work in mining, the COM, has made the following changes: “improving lighting in working and travelling areas, providing safe toilet, shower and changing facilities, and (in some mines) ensuring that women have work buddies who make sure they do not have to move around quiet areas on their own. Along with physical safety precautions, it is acknowledged that the best way of ensuring women’s safety at work is changing the mindset of their male colleagues.” (SA, 2017a:4). “Female employees, unions, management, the COM and equipment manufacturers have put considerable time over the last few years into identifying aspects of equipment that need to change to be work-appropriate for women employees. These may include the cut and size of overalls, the size and fit of helmets, goggles and earplugs, and the size and proportions of boots and gloves” (SA, 2017a:4).

- ***Maternity and pregnancy:*** The IOL’s 2011 report on “Equality at work: The continuing challenge”, contained good and bad facts about worldwide trends discrimination in occupations and employment. The report gives results of discrimination related to maternity and pregnancy and indicates that this type of practice is still common. It further states that women’s access to certain jobs is restricted based on their reproductive roles. Numerous equality bodies internationally have witnessed increased discrimination towards women on “grounds of maternity.” Factors include cases of dismissals for

nursing or being pregnant, failure to allow women time for nursing, denial of promotion, withholding of prenatal and/ postnatal benefits, and refusing to allow women to return to their jobs after maternity leave. In some countries, the improved legislation is trying to eliminate these discriminatory issues (ILO, 2011:xi). Section 95 of the report (ILO, 2011:24) shows that 39% of African countries are in line with the ILO standards in terms of maternity benefits, 23 in Asia and 78% in the EU (European Union). In spite of significant legislation, maternity discrimination still exists and is on the increase, as observed by many worldwide equality commissions (ILO, 2011:25).

- **Sexual Harassment:** Sexual harassment of women continues on every continent, and legal frameworks with stronger enforcement and greater awareness of this problem are required. Regarding sexual orientation, violence, discrimination and harassment, associated with stigmatization, is sometimes faced by lesbian, bisexual and transgender persons (including women) in the workplace or seeking employment (ILO, 2011:xi). Section 106 of the report (ILO, 2011:27) explains that surveys have shown noteworthy rates of sexual harassment - between 40-50% of women in the EU report some form of sexual harassment in the workplace, 30-40% in Asia and the largest number occurs in Australia. Research conducted in numerous countries indicates that women working in core mining areas are still seen as sexual objects and thus exposed to sexual harassment.

In a study conducted in SA, Botha (2016:9) states that working night shift “contributes to the occurrence of sexual harassment incidents, as male co-workers often take advantage of these circumstances” thus, women in the mining industry do not feel safe when working with men during the night. Women also do not feel safe in the cages which are used to transport workers because these are often packed to their maximum capacity, which allows and/or forces workers to press against each other. The study also found that there are still women who are afraid to report sexual harassment incidents because they are terrified of losing their jobs and it is difficult to lodge complaints with male supervisors. Botha (2016:9) also found that sexual favouritism is rife in the mining industry. Women are verbally harassed on a regular basis and often feel offended by the type of language used by their male co-workers.

- **Ablution Facilities/Toilets:** Ntombela, who has been a mining law specialist for over 17 years, mentions that the ablution facilities which both men and women use in the mines create circumstances that are set for harassment (Anon., 2014:30). When addressing delegates at the 6th Women in Mining Conference in 2015, Bogopa mentioned that many mines do not accommodate women in general and, in particular, pregnant women, and highlighted how important it is to ensure that women are provided with facilities to support them in the event of their having difficulties during pregnancies or miscarriages. She went on further to state that women are not given separate toilet and ablution facilities or the right to privacy (Senkhane, 2015:10).
- **PPE & Equipment vs physical strength:** Women who are involved in core mining activities are exposed to various hazards. They face greater risks pertaining to their safety, because, personal protective equipment (PPE), mining machinery, equipment and tools are not designed to be utilised by women (Botha and Cronje, 2015: 2). Frequently the physical strength required for many underground tasks precludes women from performing these effectively. Difficult jobs such as those executed by Rock Drill Operators may have physiological risks for women (SA, 2017a:2).
- **Safety:** Amponsah-Tawiah *et al.* (2015:16) reported that, employees' inappropriate perceptions with regard to safety and the efficient and effective nature of facilities or equipment utilized by employees, contribute to turnover intent, once employees' consider the accidents or effects which are likely to occur, thus causing them to fear injury or decease.
- **Remuneration gaps:** Section 84 of the report on “**Equality at work:** The continuing challenge” (ILO, 2011:22) mentions that there is still a wide gap regarding salaries between women and men in the workplace. The report further states in Section 87 that a noteworthy portion of gender pay gaps is a result of “occupational and sectoral segregation.” In the United Kingdom (UK), a first world country, data revealed that women occupied two-thirds of the low-paid jobs compared to two-fifths in other jobs.. However, there has been progress, such as that which has occurred across the EU, where equal pay is now mandatory in its legislation and must be adopted by countries which seek accession to the EU. South Africa and Canada also have comprehensive

anti-discrimination legislation. In general, Trade Unions are making an effort to address gender gaps (ILO, 2011:22).

- **Gender roles:** According to Crawford and Mills (2011e:101) a hierarchy in an organisation sets the conditions under which its employees have access to one another and governs the routines and tasks of such interactions. It reveals the organisation's social structure, through which the formative context of society is reflected in the organisation's institutional structures. Once a formative context becomes constant, it reinforces a system of social hierarchies and divisions regarding levels of roles. Conflict resolution and decision making are performed by employees on the upper levels. In patriarchal organisations, defining job roles and positions are generally based on social definitions of gender roles which can become problematic. Crawford and Mills (2011e:101) mentions in their study that, when the number of women with equivalent or similar qualifications, ambitions and/or skills to those of their male counterparts increases, segregating employees on a gender basis becomes a problem, because restricting talent based on gender is not good business sense and has a negative impact on the business.
- **Turnover intent:** Kanwar *et al.* (2012:29) stated that women tend to leave jobs more frequently than men do, due to lower job satisfaction, or because they are employed in low-level jobs. It was also noted that women have to work harder to achieve a balance between their family/social commitments and work, resulting in their spending less time at work than men, thus causing them to receive adverse treatment in the workplace. Kanwar *et al.* (2012:32) indicate that "male employees are more satisfied with their jobs when compared to their female counterparts", because of women with mobility constraints, family responsibilities, conflicting roles and such like, find it challenging to manage family and work responsibilities simultaneously. This conflict leads to lower job satisfaction and higher turnover intent. "Work-life balance is certainly more important for women than for men. Although family structures, gender roles and societal expectations are undergoing important changes, women still have the primary responsibility for their family and the upbringing of children" (Kanwar *et al.*, 2012:32).

2.4.1. Conclusions:

From the above literature review, it is apparent that in the mining industry, women are prone to sexual harassment, maternity and pregnancy discrimination, lack of proper ablution and toilet facilities, lack of appropriate PPE and Equipment, remuneration gaps, and gender role disparities, some of which are aligned to turnover intent.

The SA COM and the DMR have made some changes to improve the challenges faced by women in the mining industry, while the ILO has made some improvements for women in the global labour market, which includes SA. "With the support of ILO, more equality policies and action plans have been adopted and implemented at the national and workplace levels over the past four years" (ILO, 2011:xiv). However, it appears that these enhancements are still not enough.

2.5 CHAPTER SUMMARY

The fact sheet of the COM for 2017 indicates that the number of women working in the mining industry in SA increased from approximately 11 400 in 2002 to approximately 57 800 in 2015. It is a growth of 13% over the 15-year period (SA, 2017a:1). According to Stats SA, the population of SA is 55 653 654, of which 28 406 428 are female. This figure represents 51% of the population (Stats SA, 2016), indicating that the female population of South Africa is larger than the male, and still, the mining industry only has a small percentage (18% in 2015 as stated section 2.3.3 above) of women employees.

From the above literature review, it is apparent that there are still austere challenges faced by women in the mining industry both in SA and globally. Failure to attend to these could result in severe economic and social implications, as well as delay the transformation of the industry. "Economic development is not enough to shrink all gender disparities, but corrective policies that focus on persisting gender gaps are essential" (Mompei, 2016:28). However, the dominant male culture is deeply entrenched within mining related organisations which consequently are more resistant to the implementation of change (Crawford & Mills, 2011e:104).

Policies which are more considerate of women regarding sexual harassment, PPE, maternity and family-friendly policies need to be both improved and/or created. Legal frameworks and

stronger enforcement thereof is certainly needed, together with a greater awareness of all issues related to gender inequality. The introduction of such policies will, in turn, reduce the turnover intent of women in the mining industry and, hence, contribute to the transformation of the industry.

The conducting of this literature review study also assisted the researcher to develop questions for the survey used in this study, see ***Annexure 4***. The findings are detailed in Chapter 3 and Chapter 4.

CHAPTER THREE:

DESCRIPTIVES AND FREQUENCIES

3.1. INTRODUCTION

As outlined in **Chapter 1: Section 1.4**, the primary objective of this research study is to gauge the perceptions of women in the workplace within the mining industry, specifically in SA and the impact the mining industry has on these women. The secondary objective is to determine if women in the mining industry in SA are still subject to:

- sexual harassment,
- poor toilet facilities,
- an uncondusive work environment,
- unsuitable protective gear,
- a lack of development and promotion,
- victimisation for being child-bearing individuals; and
- the provision of unsuitable accommodation,

and to further determine if this adverse environment makes them experience:

- demotivation;
- vulnerability;
- challenges in the workplace;
- burnout;
- turnover intention;

and to make recommendations to the mining industry to implement improvements for women in the workplace, and to make recommendations for future research.

In **Chapter 2** relevant South African literature on “The perceptions of women in the workplace in the South African mining industry” is discussed, as well as global literature pertaining to similar matters. This review provided the theoretical background to the study and ideas for the questionnaire used for the research survey, which generated the empirical findings outlined in

Chapters 3 and 4 of this research report. **Chapter 5** will cover the conclusions drawn from the findings and the recommendations made.

Chapter 3 addresses the research methodology, research design, sampling, data collection, coding, biographical information analysis, descriptive statistics and frequencies, as well as and findings. To formulate **Chapter 3**, the biographical information is obtained from the analysed quantitative data contained in **Section 1** of the questionnaire, while in **Section 2** of the questionnaire the focus is on obtaining information on the participants qualifications and job experience, and **Section 3** of the questionnaire focuses on statements on the perceptions of the workplace from women in the mining industry, rated on a 5-point Likert-type scale, are measured. This information is analysed and translated into tables or diagrams, which are further explained. In addition to this coding of statements, descriptive statistics and frequencies are examined and the results captured in **Chapter 3**. The questionnaire in **Annexure 4** indicates rankings in the following order which better explain the study findings:

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Agree
- 4 - Strongly agree
- 5 - Neutral

At the time of generating the statistics, the rankings were recorded to simplify interpretation of results, and the following ranking was utilised:

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly agree

Descriptive statistics are reported per statement as 'means' as well as 'standard deviations'. The ideal overall response from each participant would be 4, which indicates that the participant mainly agreed with the statements, while an overall response tending towards a 2 meant that the participant mainly disagreed, except for a minor number of reversed statements. Ratings of

lower than 2.5 were considered as low and showed that in the experience of the participant, the mine's compliance with that particular statement is very limited or nonexistent. The contrary interpretation applies to the reversed statements. Ratings of a 'mean' of above 2.5 may possibly point towards problem areas.

3.2 RESEARCH METHODOLOGY

3.2.1 Target population

The target population consisted of female employees who are currently employed at the mines in SA on a full-time basis. The target population was targeted through the 8th Annual Women in Mining Conference held on 22 February 2017, see **Annexure 3, Annual Women in mining conference**. This population constituted a convenience sample. Permission was obtained from the Intelligence Transfer Centre (ITC) who hosts the annual Women in Mining conference each year in SA (see **Annexure 3a**).

3.2.2 Sampling

Welman *et al.* (2011: 56) states that, "A population is the full set of cases from which a sample is taken", and "the target population is the population to which the researcher ideally would like to generalize his or her results", Welman *et al.* (2011: 56). The size of a population is represented by "N". The study population comprised an availability sample of women who work in the mining industry in SA and specifically those who attended the 8th Annual Women in Mining Conference in February 2017.

A sample is defined by Bryman *et al.* (2015:383) as, "the segment of the population that is selected for research. It is a subset of the population". For this study, the method of selection was based on a non-probability convenience sample, because this sample was one that was "available to the researcher by virtue of its accessibility" (Bryman *et al.*, 2015:178). As the sample needs to represent the general population, women from various mines from the different provinces in SA were targeted. The most convenient strategy for the researcher to use to access such a target sample was to utilise the 8th Annual Women in Mining Conference in SA to distribute questionnaires, an approach that produced a 'convenience sample'.

3.2.3 Method of data gathering

The Literature research allowed the researcher to study the views of various researchers. Based on this analysis, the questionnaire was developed on a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree', see **Annexure 4**.

3.3. RESEARCH DESIGN

3.3.1 Research Approach

This study encompasses a literature review and an empirical study. A **quantitative approach** was used, as this methodology involves the counting and measuring of events, and then executing a statistical analysis on the data obtained.

As indicated in **Chapter 1** of this study, Welman *et al.* (2011:6) outline the strengths of a quantitative research method as follows:

- Provides a specific statement of the research problem;
- Precisely specifies the independent variable and dependent variables;
- Gives a clear indication or path to follow to arrive at the objective;
- Provides high levels of reliability from the data obtained because of the controlled survey questionnaire;
- Reduces subjectivity of judgment;
- Allows for longitudinal measurement of subsequent performance of subjects;
- Offers an in-depth investigation of the phenomena;
- Is not limited to rigidly definable variables;
- Examine complex questions which may be challenging to investigate with quantitative research methods; and
- Provides a challenging questionnaire, which will assist in generating the findings of the study.

Welman *et al.* (2011: 7) also outline weaknesses of the quantitative method which includes:

- Failure to provide evidence on the background of the situation; and
- Limiting outcomes due to a structured format and closed-type questions.

The reasons for choosing the quantitative method is that it allowed an in-depth examination into the study, it was not partial to strict definable variables, is a convenient method to conduct research and factors value-laden questions.

3.3.2. Instrumentation

Choosing an appropriate instrument is key in data collection to obtain valid results. The wrong choice of instruments could compromise the study's validity resulting in invalid conclusions. The paper-pencil-questionnaires can be distributed to numerous participants which avoid logistic challenges for the researcher. Participants are anonymous which results in more truthful answers, especially in dealing with controversial issues. For this study, only questionnaires were utilised for data collection.

3.3.3. Research process

Permission was requested from ITC who hosts the Annual Women in Mining Conference to conduct research at the 8th annual conference by means of distributing questionnaires to the women who attended. Once permission was granted (*see Annexure 3a*), the researcher communicated the research settings to clarify the details of the research. A contact person was assigned by the conference company to the researcher to provide assistance and support during the research. The support included distributing and collecting the questionnaires at the conference. The succeeding ethical practices were factored in the study: voluntary participation, anonymity and informed consent (Babbie & Mouton, 2011:12).

3.4. SAMPLING

The mining industry in SA is huge; sampling for this study under normal circumstance would have been a challenge, however using the 8th Annual Women in Mining Conference to target the participants, made it much easier for the researcher. This practice furthermore influenced the number of participants taking part in the study, as there were a limited number of women who attended the conference and only a portion of those who filled in the questionnaires. As the sample needed to represent the general population, women employed by various mines operating in different provinces were targeted. The study population comprised of an availability

sample of women who work in the mining industry in SA and specifically those who attended the 8th Annual Women in Mining Conference.

The researcher issued 200 questionnaires to the target population and anticipated the return of 150 of the questionnaires from the target population. The final sample of 165 questionnaires were received from the participants.

3.5. DATA COLLECTION

Data collection is essential in any research study, in order to generate valid results. This research study employed a **quantitative research method** with the emphasis on data collection through the use of questionnaires.

The questionnaire has three sections which comprise the following:

1. **Section 1** which focused on obtaining biographical information,
2. **Section 2** which focused on obtaining information on the participants qualifications and job experience, and
3. **Sections 3** which comprises 35 statements that sought to ascertain women in the mining industry's perceptions of their workplace. A 5-point Likert-type scale rating was utilised in the study ranging from strongly disagree to strongly agree. According to Kothari (2004:84), Likert-type scales or Summated scales are created by using the item analysis approach in which a certain item is evaluated "on the basis of how well it discriminates between those persons whose total score is high and those whose total score is low. Those items or statements that best meet this kind of discrimination test are included in the final instrument."

3.6. BIOGRAPHICAL INFORMATION

The following section highlights the biographical information of participants from a convenience sample and information obtained from quantitative data.

The mining industry is vast and very diverse, stretched throughout the different SA provinces. It does not only constitute different sectors of mining, but also different types of mining in terms of above ground or underground conditions. The requirements and working environments differ

among these types of work situations, hence the researcher needs to make a clear distinction between women who work in the different provinces, sectors and underground or in open pit mining. This division allows the researcher to capture perspectives of women in the industry as a whole. In addition to the different type of mining, there are also different racial groups employed at the mines and women who belong to unions. All these women's perceptions are critical to this study.

In the information examined and explained below, participants represent the province and sector in which they work, open pit and/ deep/underground mine employment, place of work in the mining industry, racial group and union affiliation.

As mentioned in 3.4 above, a total of 165 questionnaires out of the 200 questionnaires distributed were returned.

3.6.1 Province working in

As outlined in **Chapter 1: Section 1.4**, the primary objective of this research study is to gauge the perceptions of women in the workplace in the mining industry, specifically in SA and how these conditions impact these women, hence the researcher required that the participants of the survey indicate which province they work in. **Figure 3.1** reflects the participant breakdown in terms of the different provinces in which the participants work.

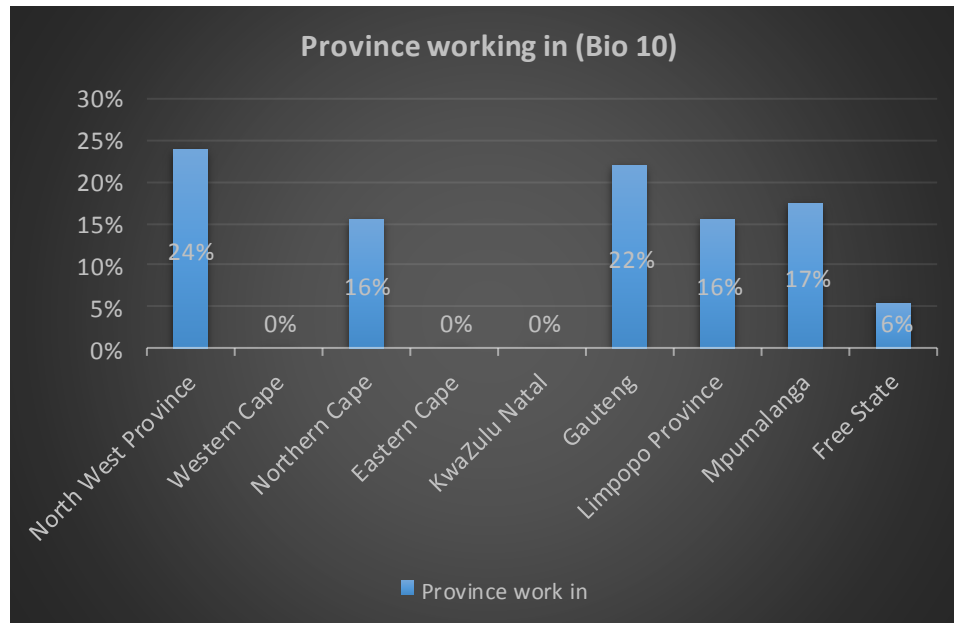


Figure 3.1: Distribution of research participants by province in which they work

Source: Constructed by author (2017)

Three out of the nine provinces were not represented, meaning that 67% are represented in the study, which is a large enough representation for the researcher to work with for this particular study. A total of 109 female participants indicated the province in which they work within the mining industry of SA. 24% work in the North-West province, 0% in Western Cape, 16% in Northern Cape, 0% in Eastern Cape, 0% in KwaZulu Natal, 22% in Gauteng, 16% in Limpopo province, 17% in Mpumalanga and 6% in Free State. This spread of provinces is sufficient to cover the perceptions of women throughout SA, and it is a good representation of women working in the mining industry in SA.

3.6.2 Mining sector

To further demonstrate that most sectors of the mining industry in SA have been considered in this study, the researcher requested that participants indicate the sector in which they are employed.

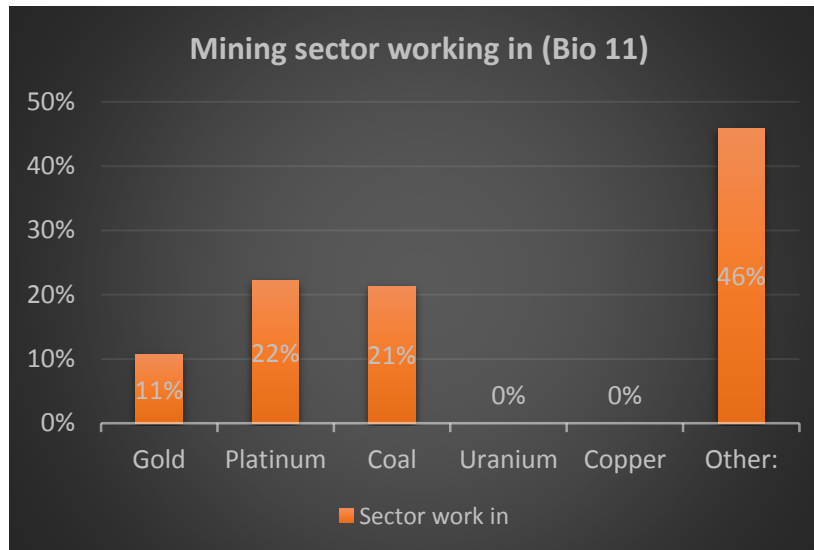


Figure 3.2: Distribution of research participants by mining sector

Source: Constructed by author (2017)

Figure 3.2 reflects the participant breakdown in terms of the different mining sectors in which the participants work. In total 122 female participants indicated their specific mining sector. 11% work in the gold sector, 22% work in the platinum sector, 21% work in the coal sector, 0% in copper and 46% stated that they work in other sectors. The reason for considering each sector is to look at the industry as a whole when drawing conclusions regarding the statements. These responses will also demonstrate if the workplace conditions differ among the different sectors.

3.6.3 Open pit and Deep mining/ underground mine

Figure 3.3 reflects the participant breakdown regarding working in open pit or deep mining/underground mining. This itemisation measures the different conditions in which women work because different types of mines differ regarding working conditions.

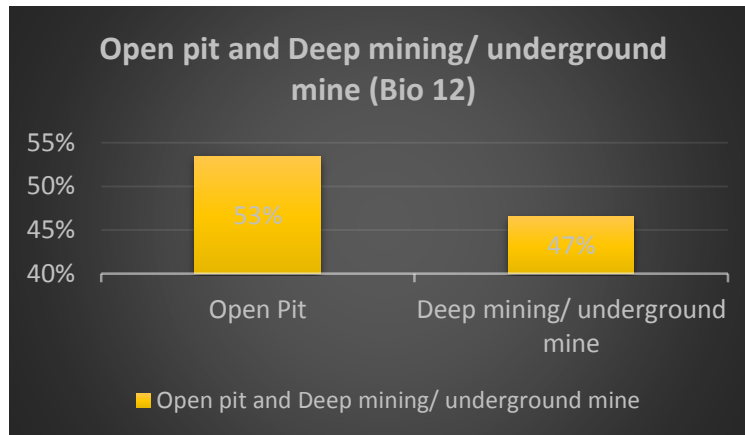


Figure 3.3: Distribution of research participants working in open pit and Deep mining/underground

Source: Constructed by author (2017)

In total 101 female participants indicated their position of work regarding open pit and deep pit/underground mining. 53% work in open-pit mining and 47% work in deep pit/underground mining in SA. The responses from these women provide the researcher with a good understanding as to whether there has been an improvement in the environment of both underground and/ open pit mines.

3.6.4 Place of work on mines

Figure 3.4 reflects the participant breakdown regarding the different areas in which the participants work at the mines. Women tend to work more in non-core fields on the surface as outlined in Chapter 2.

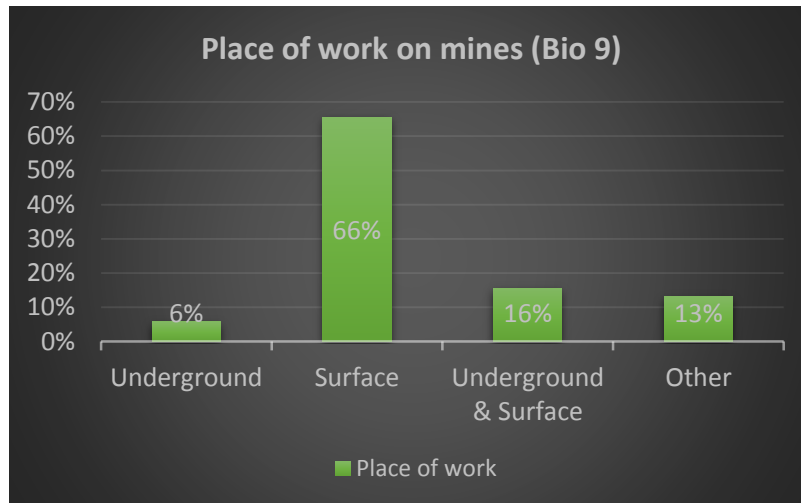


Figure 3.4: Distribution of research participants by place of work

Source: Constructed by author (2017)

In this study, a total of 122 women responded as to their place of work on the mines in SA, of which 6% work underground, 66% work on the surface, 16% work underground and on the surface and 13% stated that they work in other areas. In **Chapter 2, Section 2.3.1**, it is stated that no women are allowed to work underground in the Mines and Works Act (27 of 1956), and, as mentioned in the Abstract, subsequent legislation required the inclusion of women in core activities to be at 10% in 2009. In **Chapter 2**, the researcher mentioned that mining houses are hesitant to including women in their workplace, due to women having special needs which mines are unable to accommodate. Such needs include suitable toilet facilities, change rooms, as well as protective gear which is appropriate for women. It was also noted that women struggle to cope with the extreme temperatures that men can tolerate when working underground (Mlambo, 2011). Much work needs to be done by the industry to attract and retain women to work underground.

3.6.5 Race

Regarding transformation, SA as a whole, and the mining industry, in particular are guided by legislation to include women and, more especially, Black women in the workplace. **Figure 3.5** reflects the participant breakdown regarding their racial groups.

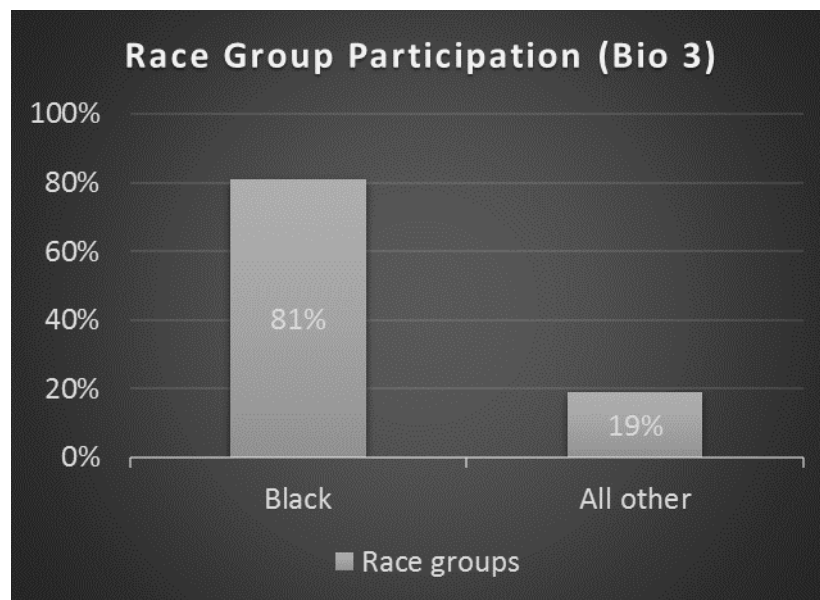


Figure 3.5: Distribution of research participants by race

Source: Constructed by author (2017)

All participants in this study are female/ women, with a total of 126 indicating their race group, of which 81% belong to the Black race group and 19% of the “All other” race group. The “All other” race group category was created during the generation of statistics because there are only a few participants who are not Black women. Although the participation of women, especially Black women in the mining industry in SA has increased over the years, their participation is still lagging behind the number of men working underground as can be seen in **Figure 3.4** above.

3.6.6 Union affiliation

The researcher wanted to investigate how many women are union members in order to establish if women are making use of organised labour to represent them and to examine if unions play a part in the improvement of the women's workplaces in the mining industry.

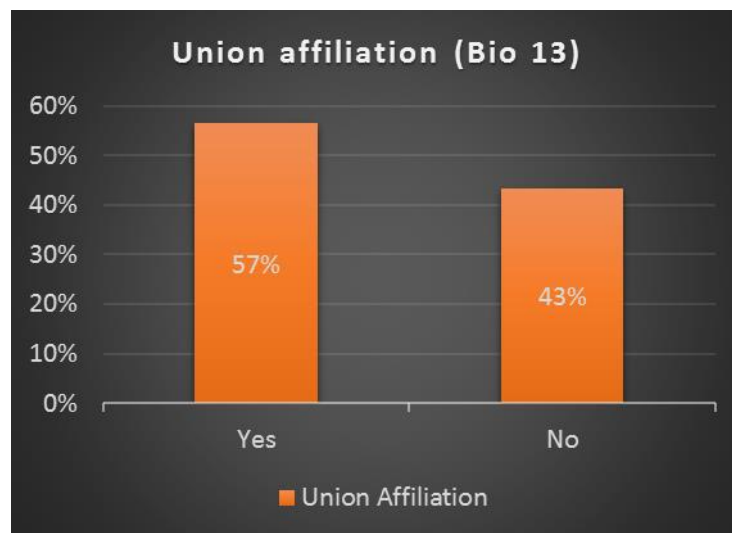


Figure 3.6: Distribution of research participants pertaining to union affiliation

Source: Constructed by author (2017)

Figure 3.6 reflects the participant breakdown in terms of women working at the mines in SA and their union affiliation. In total 122 female participants indicated their union affiliation, 57% belong to a union and 43% do not. This means that 53% of the participants can confidently contribute to answering if unions have made a difference to their workplace.

The next section gives insight into the coding method utilised.

3.7 CODING:

Bryman *et al.* (2015:42), states that in order for the researcher to analyse and interpret data extracted from the gathered questionnaires, a coding technique is utilised which aids in identifying answers to research questions and also helps generate theories. Coding pinpoints prominent patterns in the data, which can then be used in the study.

The statements in **Table 3.1** below are coded to allow the researcher to conduct and generate an overall analysis of the statistical data and ultimately generate findings which make interpretation possible, based on the answers received on a 5-point Likert scale explained in Section 3.1. above.

Table 3.1: Statements and statement codes

Statement Code	Statements in Section 3 of questionnaire:
Q1	Transformation is at the top of this organisation's agenda.
Q2	Management reminds employees about the importance of women in the organisation.
Q3	Management encourages employees to embrace diversity.
Q4	I feel that females' inputs are valued in the organisation.
Q5	The facilities at the organisation are conducive for women to work in.
Q6	Men in the workplace think women are weak.
Q7	Women get promoted more easily than men are.
Q8	Women in management need to work extra hard to prove themselves.
Q9	There are good relations between female and male miners.
Q10	There are good relations between female and male management.
Q11	Male managers dominate the work environment.
Q12	The female miners' uniforms are comfortable for them to work in.
Q13	Personal protective equipment and clothing have been designed especially for women.
Q14	The toilets at the workplace are suitable for females on surface.
Q15	The toilets at the workplace are suitable for females underground.
Q16	It is easy for women to communicate with men in the workplace.
Q17	Male workers harass females.
Q18	I am a victim of sexual and/or physical harassment.
Q19	Male workers emotionally abuse me at times.

Q20	Male managers understand that I am also a mum with responsibilities.
Q21	Taking child responsibility leave is a problem.
Q22	Pregnant women are moved to non-hazardous working environments
Q23	The organisation has made changes to accommodate women.
Q24	My manager supports women's development in their careers.
Q25	My manager is keen to approve studies for females.
Q26	The organisation offers training programmes for females.
Q27	There are more men than women on training programmes.
Q28	Programmes are in place to address gender inequalities.
Q29	Management involves women in decision making.
Q30	I have a career development plan in place.
Q31	I am on a mentorship programme.
Q32	Unions have made a difference in the improvement in the workplace for women.
Q33	I am forced to work at the mines as the income is good.
Q34	Given the chance, I will not work at a mine.
Q35	I believe that there is a place for women in the mining industry.

3.8. DESCRIPTIVE STATISTICS AND FREQUENCIES

The use of Descriptive Statistics is a significant method for establishing the validity of a sample representing the sampled population. In determining women's perceptions of the workplace in the SA mining industry, it is evident from **Table 3.2** that the quantitative data attained from the participants yielded different results. To elaborate on the data the 'mean' is utilised to measure central tendency, as reflected in **Table 3.2**.

Table 3.2: Descriptive Statistics

Descriptive Statistics						
No.	STATEMENT	N	Mini- mum	Maxi- mum	Mean	Std Devi- ation
Q1	Transformation is at the top of this organisation's agenda.	125	1	5	3.44	1.37
Q2	Management reminds employees about the importance of women in the organisation.	129	1	5	3.03	1.34
Q3	Management encourages employees to embrace diversity.	125	1	5	3.51	1.25
Q4	I feel that females' inputs are valued in the organisation.	127	1	5	3.21	1.30
Q5	The facilities at the organisation are conducive for women to work in.	126	1	5	3.57	1.09
Q6	Men in the workplace think women are weak.	127	1	5	3.61	1.29
Q7	Women promoted more easily than men are.	127	1	5	2.04	0.96
Q8	Women in management need to work hard to prove themselves.	127	1	5	4.28	1.01
Q9	There are good relations between female and male miners.	128	1	5	3.34	1.03
Q10	There are good relations between female and male management.	126	1	5	3.31	1.16
Q11	Male managers dominate the work environment.	126	1	5	4.33	1.05
Q12	The female miners' uniforms are comfortable for them to work in.	124	1	5	3.08	1.23
Q13	Personal protective equipment and clothing have been designed especially for women.	124	1	5	2.90	1.29
Q14	The toilets at the workplace are suitable for females on surface.	125	1	5	3.59	1.19
Q15	The toilets at the workplace are suitable for females underground.	114	1	5	2.81	1.27
Q16	It is easy for women to communicate with men in the workplace.	122	1	5	3.56	1.10
Q17	Male workers harass females.	126	1	5	2.86	1.198

Q18	I am a victim of sexual and/or physical harassment.	124	1	5	1.81	1.11
Q19	Male workers emotionally abuse me at times.	122	1	5	2.36	1.32
Q20	Male managers understand that I am also a mum with responsibilities.	119	1	5	2.96	1.37
Q21	Taking child responsibility leave is a problem.	122	1	5	2.79	1.41
Q22	Pregnant women are moved to non-hazardous working environments	126	1	5	4.32	0.91
Q23	The organisation has made changes to accommodate women.	124	1	5	3.48	1.24
Q24	My manager supports women's development in their careers.	123	1	5	3.47	1.35
Q25	My manager is keen to approve studies for females.	125	1	5	3.40	1.31
Q26	The organisation offers training programmes for females.	126	1	5	3.46	1.24
Q27	There are more men than women on training programmes.	125	1	5	3.81	1.20
Q28	Programmes are in place to address gender inequalities.	125	1	5	3.03	1.26
Q29	Management involves women in decision making.	124	1	5	2.92	1.31
Q30	I have a career development plan in place.	124	1	5	3.40	1.41
Q31	I am on a mentorship programme.	122	1	5	2.67	1.34
Q32	Unions have made a difference in the improvement in the workplace for women.	123	1	5	3.20	1.34
Q33	I am forced to work at the mines as the income is good.	123	1	5	2.53	1.37
Q34	Given the chance, I will not work at a mine.	124	1	5	2.52	1.44
Q35	I believe that there is a place for women in the mining industry.	125	1	5	4.34	1.11

Mean:

Interpreting the mean in **Table 3.2** above, it can be seen that more women agree that management in the SA mining industry encourages their employees to embrace diversity and more women feel that the facilities at the organisation where they work are conducive for women to work in.

Most women agree that their male counterparts think that women are weak.

When it comes to the perception of women in the mining industry in terms of women in management, many of the women respondents feel that women need to work extra hard to prove themselves in the workplace, and many also feel that male managers dominate the work environment, while most respondents agree that it is easy for women to communicate with men in the workplace.

More women agreed that the toilets on the surface at the workplace are suitable for women.

The majority of respondents agree that “pregnant women are moved to non-hazardous working environments” and many believe that “there is a place for women in the mining industry”, and that the organisations in which they work have made changes to accommodate women’s needs.

Most women also agree that “There are more men than women on training programmes”.

Most women “believe that there is a place for women in the mining industry.”

Looking at the lower end of the mean values, most women disagree that “Women are promoted more easily than men”. The majority disagreed that they are victims of sexual and/or physical harassment and that their male counterparts emotionally abuse women. Many women are not forced to work at a mine, while most disagreed with the statement ‘Given the chance, I will not work at a mine’.

Participant percentage response and analysis:

The frequencies are reflected in **Table 3.3** below for analysis.

Table 3.3: Percentage breakdown of participants' perceptions of women in the workplace in the SA mining industry

Percentage breakdown of participants' perceptions							
		1	2	3	4	5	
No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Missing
Q1.	Transformation is at the top of this organisation's agenda.	10.1	19.4	7.0	38.8	21.7	3.1
Q2.	Management reminds employees about the importance of women in the organisation.	14.0	31.0	7.8	32.6	14.7	0.0
Q3.	Management encourages employees to embrace diversity.	7.8	19.4	5.4	44.2	20.2	3.1
Q4.	I feel that females' inputs are valued in the organisation.	8.5	30.2	8.5	34.1	17.1	1.6
Q5.	The facilities at the organisation are conducive for women to work in.	3.9	17.8	10.9	48.8	16.3	2.3
Q6.	Men in the workplace think women are weak.	6.2	21.7	5.4	35.7	29.5	1.6
Q7.	Women get promoted more easily than men are.	27.9	51.9	7.8	8.5	2.3	1.6
Q8.	Women in management need to work extra hard to prove themselves.	3.1	5.4	4.7	32.6	52.7	1.6
Q9.	There are good relations between female and male miners.	3.1	22.5	20.9	43.4	9.3	0.8
Q10.	There are good relations between female and male management.	7.8	20.9	12.4	46.5	10.1	2.3
Q11.	Male managers dominate the work environment.	3.1	7.0	3.1	25.6	58.9	2.3
Q12.	The female miners' uniforms are comfortable for them to work in.	10.9	24.8	17.1	32.6	10.9	3.9

Q13.	Personal protective equipment and clothing have been designed especially for women.	15.5	28.7	10.9	31.8	9.3	3.9
Q14.	The toilets at the workplace are suitable for females on surface.	10.1	7.8	12.4	48.1	18.6	3.1
Q15.	The toilets at the workplace are suitable for females underground.	17.8	19.4	20.9	22.5	7.8	11.6
Q16.	It is easy for women to communicate with men in the workplace.	4.7	16.3	10.1	48.8	14.7	5.4
Q17.	Male workers harass females.	14.0	28.7	19.4	28.7	7.0	2.3
Q18.	I am a victim of sexual and/or physical harassment.	50.4	27.9	7.0	7.0	3.9	3.9
Q19.	Male workers emotionally abuse me at times.	30.2	32.6	7.0	17.1	7.8	5.4
Q20.	Male managers understand that I am also a mum with responsibilities.	16.3	25.6	10.1	26.4	14.0	7.6
Q21.	Taking child responsibility leave is a problem.	20.9	27.1	13.2	17.8	15.5	5.4
Q22.	Pregnant women are moved to non-hazardous working environments	1.6	4.7	6.2	34.1	52.2	2.3
Q23.	The organisation has made changes to accommodate women.	7.8	16.3	15.5	34.9	21.7	3.9
Q24.	My manager supports women's development in their careers.	10.9	15.5	12.4	31.0	25.6	4.7
Q25.	My manager is keen to approve studies for females.	10.9	14.7	20.2	27.1	24.0	3.1
Q26.	The organisation offers training programmes for females.	8.5	16.3	15.5	36.4	20.9	2.3
Q27.	There are more men than women on training programmes.	5.4	13.2	7.8	38.8	31.8	3.1
Q28.	Programmes are in place to address gender inequalities.	14.7	20.9	17.1	34.9	9.3	3.1
Q29.	Management involves women in decision making.	18.6	21.7	13.2	34.1	8.5	3.9
Q30.	I have a career development plan in place.	12.4	20.2	5.4	32.6	25.6	3.9

Q31.	I am on a mentorship programme.	20.2	34.1	7.0	23.3	10.1	5.4
Q32.	Unions have made a difference in the improvement in the workplace for women.	14.0	17.8	15.5	31.0	17.1	4.7
Q33.	I am forced to work at the mines as the income is good.	28.7	25.6	13.2	17.8	10.1	4.7
Q34.	Given the chance, I will not work at a mine.	31.0	26.4	10.9	14.0	14.0	3.9
Q35.	I believe that there is a place for women in the mining industry.	6.2	1.6	6.2	22.5	60.5	3.1

Taking into account, the data collected and information contained in **Table 3.3** above, the following is a summary of the statements and detailed findings:

Regarding transformation being at the top of an organisation's agenda, 38.8% of women strongly agree, and 21.7% agree, this strongly suggests that there is a vast improvement in transformation in the industry. While 31.0% of women disagree that "management reminds employees about the importance of women in the organisation", 32.6% agree. There are still many women who feel that management needs to remind the employees of the importance of women in the industry, yet 44.2% of women agree that "management encourages employees to embrace diversity", and 20.2% strongly agree with this statement. 30.2% of women disagree that they "feel that inputs are valued in the organisation", while 34.1% agree that they are. A very large number of women, 48.8%, feel that the facilities in the workplace at the mines are conducive to women workers, and this could be due to the fact most women work on the surface of mines. Many women agree (35.7% agree, and 29.5% strongly agree) that men in the industry think that women are weak. The majority of women do not agree that women are promoted easier than men (51.9% disagree and 27.9 strongly disagree. 52.7% of women strongly agree, and 32.6% agree that "Women in management need to work extra hard to prove themselves". Most women agree that "there are good relations between female and male miners' and that there are also "good relations between female and male management." A large number of women (58.9%) strongly agree, and 25.6% agree that male managers still dominate the workplace in the mining industry in SA.

In terms of the provision of clothing and PPE for women in mining, 32.6% of women agree that mining uniforms are comfortable for them to work in, while 24.8% disagree. 28.7% of women

disagree that the “Personal protective equipment and clothing have been designed especially for women”, while 31.8% agree. It is questionable, however, as to what percentage of the women respondents are actually qualified to draw such a conclusion, because, based on information contained in Section 3.64 above, only 6% of them work underground and, thus, it can be assumed that very few of them have experience of wearing the uniforms or using the PPE.

Pertaining to the toilet facilities, most women respondents agree that the toilets for women on the surface of the workplace are suitable for women, while in terms of the underground toilets 19.4% disagreed and 17.7% strongly disagreed that they were suitable for women.

With regards to communication and workplace harassment, the survey indicates that 48.8% of the women respondents find it easy to communicate with men in the workplace, yet 28.7% agree that men harass women in the workplace and, 7% agreed and 3.9% strongly agree that they victims of sexual and/or physical harassment, while 50.4% strongly disagree to being victims. Also 32.6% disagree that men emotionally abuse them, while 17.1% agree and 7.8% strongly agree.

Working women have responsibilities towards their children, yet 26% of the women respondents stated that their male managers do not understand that they are mothers with responsibilities, while 26% stated the opposite. Regarding this, while according to information provided in the Literature Study in **Chapter 2**, there has been some improvement in maternity benefits in recent years, however, 33.3% still struggle to take child-responsibility leave, which is still a large number. The majority of respondents (52.2%) strongly agree that “pregnant women are moved to non-hazardous working environments”, which is a great stride in the industry, and a high portion of respondents agree that changes have been made in the mining industry to accommodate women.

Regarding development and training, 31.0% agree, and 25.6% strongly agree that their manager “supports women’s development in their careers”. Regarding managers being keen to approve studies for women, 27.1% agree while 25% do not agree. Most women agree (36.4%) and strongly agree (20.9%) that the mining houses offer training programmes for women. 58.2% have a “career development plan in place”, and only 32.6% do not, while 33.4% of the women respondents are on a mentorship programme and 54.3% are not. However, a total of 70.6%

(38.8%=agree and 31.8%= strongly agree) agree that there are more men than women on training programmes.

To address gender inequalities in the workplace, 34.9% respondents agree that there are programmes in place for this, while a total of 36.0% (20.9=disagree and 14.7=strongly disagree) are not in agreement. Yet, 31.4% agree that “management involves women in decision making”, while 40.3% (21.7% disagree and 18.6 strongly disagree) disagree.

A larger portion of women are in agreement that “unions have made a difference by initiating improvements in the workplace for women”, with 31.0% agreeing and 17.1% strongly agreeing.

The women respondents are of the view that they have ‘what it takes’ to work at the mines, because 83% of them believe that “there is a place for women in the mining industry”, with 54.3% women who are not forced to work at a mine and 27.9% who are. Only 28% of the women if “given the chance, will not work at a mine” while 57.4% who will continue.

3.9 CHAPTER SUMMARY

This chapter provided empirical findings and, in order for the researcher to cover the entire SA mining industry, women respondents were targeted at the 8th Annual Women in Mining Conference, held on 22 February 2017. Empirical study findings are presented, covering a sample of women from six provinces in SA, with the minor limitation of no representatives from 3 provinces. Various mining sectors, including gold, coal and platinum, were considered, as well as both open-pit and underground workers who took part in the survey. Participants also comprised women who work underground or on the surface of mines, and from various racial groups. The sample also constituted women who belong to mine workers’ unions as well as those who do not. All of these details are provided in the Biographical Information presented earlier in this chapter.

Further to these descriptive statistics and frequencies which were provided and interpreted, the percentage breakdown of participants’ perceptions of women in the workplace in the SA mining industry was both further examined and explained in the form of detailed findings.

The research showed that as much as the participation of women in the mining industry in SA has increased over the years, there are still not enough women working underground. Only 6% of the women who participated in this research project work underground. The research also indicated that women in management need to work extra hard to prove themselves **and** that male managers still dominate the industry, and yet, many of the women respondents perceive that men believe that “there is a place for women in the mining industry”. However, the majority of women feel that they are promoted less frequently than men.

The study found that pregnant women are moved to non-hazardous working environments, which is an improvement in the mining industry.

Other findings include the fact that most of the women respondents agree that ‘if given a chance (I) will not work at a mine, and many of them agree that men in the mining industry think that women are weak, that male managers still dominate the industry, and women are not easily afforded child-responsibility benefits or leave – a total of 33.1% report they experience difficulties in this area.

While that study found that 44.2% of women respondents agree that “management encourages employees to embrace diversity” there are still many of them who feel that management needs to remind the employees of the importance of women in the industry because women add value and need to be treated with respect.

As much as most of the women respondents agree that “there are good relations between female and male miners’ and that there are also “good relations between female and male management”, a large number of the women agree strongly that “Women in management need to work extra hard to prove themselves”.

In terms of clothing, the findings of the study indicate that the PPE and uniforms for women miners are uncomfortable while the toilet facilities for women on surface of mines are acceptable, the underground toilet amenities provided for women are not suitable.

Another finding is that although only a small percent of the women respondents’ regard themselves victims of sexual and/or physical harassment (10.9%), 28.7% women agree that the fact that men harass women in the workplace is still a problem.

A large number of women respondents agree that changes have been made to accommodate women in the industry, which is good. This positive trend needs to be maintained and enhanced when and where ever possible. Great strides have been made in the mining industry for the development and training of women. However a total of 70.6% of the women respondents agree that there are more men than women on training programmes and 40.3% of women deny that management involves women in decision making in the mining industry.

A larger portion of women respondents are in agreement that “unions have made a difference by initiating improvements in the workplace for women” and 83% of these women believe that “there is a place for women in the mining industry.”

In the next Chapter, details of the statistical data analysis on advanced findings are captured and explained. The Conclusions and Recommendations will be dealt with in Chapter 5.

CHAPTER FOUR:

STATISTICAL DATA ANALYSIS

4.1. INTRODUCTION

While **Chapter 3** addressed the research methodology, research design, sampling, data collection, coding, biographical information analysis, descriptive statistics and frequencies, as well as the findings of the data analysis, **Chapter 4** details the statistical data analysis utilising the quantitative data obtained from the questionnaires and analysed with the advanced statistical techniques outlined in this chapter.

The viability of factor analysis was also confirmed using the KMO (Kaiser-Meyer-Olkin) measure of sampling adequacy which indicates sample size as sufficient for factor analysis (Field, 2005:640), and the Bartlett's test of sphericity which tests the null hypothesis for the correlation matrix and p-values which suggests correlation between statements are sufficient for a factor analysis (Field, 2005:652).

A factor analysis is conducted on all statements in the questionnaire to formulate structural validity. The values indicated below were measured, and the results are reported as a part of the factor analysis:

- Communalities
- Eigenvalues Kaiser percentage of variance
- Pattern matrix
- Correlation matrix

To further test the reliability of the data collected from the questionnaires the following test was used:

- Cronbach's alpha coefficients

Regarding testing the effect of biographical variables on identified factors, the following tests were utilised:

- Correlation analysis
- T-Tests and Effect sizes
- One-way ANOVA (Analysis of variance) and Effect sizes,
- As the questionnaire comprised an all-inclusive survey, P-values are not relevant and are only indicated for completeness.

4.2 FACTOR ANALYSIS

Factor Analysis is a multivariate statistical technique utilised to reduce the number of variables, find fundamental dimensions among measured variables and constructs, and offer construct validity evidence.

In the following section, sampling adequacy is measured, factors are extracted to perform a factor analysis, the number of factors is determined, these factors then rotated and the results interpreted.

4.2.1. Correlation Matrix: Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity:

To measure sampling adequacy for factor analysis, the KMO measure of sampling adequacy and Bartlett's test of sphericity were used, as outlined in **Table 4.1**. When taken together, these tests give a minimum standard which is verified before a factor analysis is conducted. The results of this process are indicated in **Table 4.1** below.

Table 4.1: Measure for sampling adequacy and factor analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.764
Bartlett's Test of Sphericity	Approx. Chi-Square	1597.105
	Df	595
	Sig.	0.000

The KMO measure was found to be 0.764, which indicates that the sample size is sufficient for factor analysis (as mentioned above). Values for KMO between 0.7 and 0.8 are excellent (Field, 2005:640).

As mentioned above, Bartlett's test of sphericity tests the null hypothesis for the correlation matrix as an identity matrix, which is a matrix in which the diagonal elements are 1, and all off-diagonal elements are 0. In this case, the p-value is smaller than 0.05, which suggests that the correlation between the statements in the questionnaire are sufficient for a factor analysis (Field, 2005:652).

4.2.2. Communalities:

Communalities identify the degree of variance explained for each variable from extracted factors. Initial communalities were all estimated at 1.000 where each variable was accounted for by all factors. Extraction communalities were taken as estimates of variance for variables accounted for by all factors in a factor solution.

Table 4.2: Communalities

Communalities			
	Statements	Initial	Extraction
Q1	Transformation is at the top of this organisation's agenda.	1.000	0.609
Q2	Management reminds employees about the importance of women in the organisation.	1.000	0.760
Q3	Management encourages employees to embrace diversity.	1.000	0.688
Q4	I feel that females' inputs are valued in the organisation.	1.000	0.682
Q5	The facilities at the organisation are conducive for women to work in.	1.000	0.577
Q6	Men in the workplace think women are weak.	1.000	0.322
Q7	Women get promoted more easily than men are.	1.000	0.324
Q8	Women in management need to work extra hard to prove themselves.	1.000	0.426
Q9	There are good relations between female and male miners.	1.000	0.460
Q10	There are good relations between female and male management.	1.000	0.509
Q11	Male managers dominate the work environment.	1.000	0.460
Q12	The female miners' uniforms are comfortable for them to work in.	1.000	0.742
Q13	Personal protective equipment and clothing have been designed especially for women.	1.000	0.688
Q14	The toilets at the workplace are suitable for females on surface.	1.000	0.547
Q15	The toilets at the workplace are suitable for females underground.	1.000	0.498
Q16	It is easy for women to communicate with men in the workplace.	1.000	0.414
Q17	Male workers harass females.	1.000	0.498
Q18	I am a victim of sexual and/or physical harassment.	1.000	0.442
Q19	Male workers emotionally abuse me at times.	1.000	0.454
Q20	Male managers understand that I am also a mum with responsibilities.	1.000	0.442
Q21	Taking child responsibility leave is a problem.	1.000	0.433

Q22	Pregnant women are moved to non-hazardous working environments	1.000	0.270
Q23	The organisation has made changes to accommodate women.	1.000	0.691
Q24	My manager supports women's development in their careers.	1.000	0.747
Q25	My manager is keen to approve studies for females.	1.000	0.711
Q26	The organisation offers training programmes for females.	1.000	0.545
Q27	There are more men than women on training programmes.	1.000	0.241
Q28	Programmes are in place to address gender inequalities.	1.000	0.412
Q29	Management involves women in decision making.	1.000	0.535
Q30	I have a career development plan in place.	1.000	0.533
Q31	I am on a mentorship programme.	1.000	0.487
Q32	Unions have made a difference in the improvement in the workplace for women.	1.000	0.473
Q33	I am forced to work at the mines as the income is good.	1.000	0.542
Q34	Given the chance, I will not work at a mine.	1.000	0.524
Q35	I believe that there is a place for women in the mining industry.	1.000	0.457
<i>Extraction Method: Principal Component Analysis.</i>			

The values in the Extraction column show the proportion of each of the variables' variance which is explained by retained factors. Variables with low values are not well represented and ones with high values are in the common factor space. Variances are reproduced from the factors that are extracted. A principal component analysis method of factor extraction was concluded on the scores of the initial 35 items. Statements were assessed as indicators using Oblimin rotation. Statements that were loaded at less than 0.3 on any of the factors were discarded. This method was undertaken in order to exclude statements that influenced in excess of one factor. In this study, only the first six factors are retained, see **Table 4.3** on "Total Variance Explained: extracted components and rotated components".

4.2.3. Total Variance Explained:

Variance indicates how the data distributes itself around the expected value or mean because it takes into consideration all the data points and then defines their distribution. The variance explained by the Initial Eigenvalues, Extracted components (Extraction Sums of Squared Loadings), and Rotated components (Rotation Sums of Squared Loadings) is displayed in **Table 4.3**.

Table 4.3: Total Variance Explained

Total Variance Explained							
Component	(1) Initial Eigenvalues			(2) Extraction Sums of Squared Loadings			(3) Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.984	22.810	22.810	7.984	22.810	22.810	6.484
2	2.801	8.004	30.814	2.801	8.004	30.814	2.956
3	2.098	5.995	36.809	2.098	5.995	36.809	3.698
4	1.849	5.282	42.091	1.849	5.995	42.091	2.009
5	1.792	5.119	47.210	1.792	5.119	47.210	2.498
6	1.619	4.626	51.836	1.619	4.626	51.836	4.107
Extraction Method: Principal Component Analysis.							
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.							

(1) Initial Eigenvalues:

In **Table 4.3** the Initial Eigenvalues Section 1, the “Total column” provides the Eigenvalues accounted for by the components. The “% of Variance” column provides the ratio (conveyed as a %), of the variance, accounted for by the components to the “Total variance” in all variables, and the “Cumulative %” column indicates the % of variance accounted for by all components. The first six principal components made up the extracted solution and 51.836% of the total variance is explained by these six factors (**Table 4.3**).

4.2.4. Scree Plot: Eigenvalue against Component Number

To determine how many factors to settle on in conducting a factor analysis, statistical programmes offer many criteria to assist in this regard. In this study, a Scree Plot is used which graphs the Eigenvalue against the Component/ Factor number. The Eigenvalue is an index which shows how worthy a component is in the summary of data.

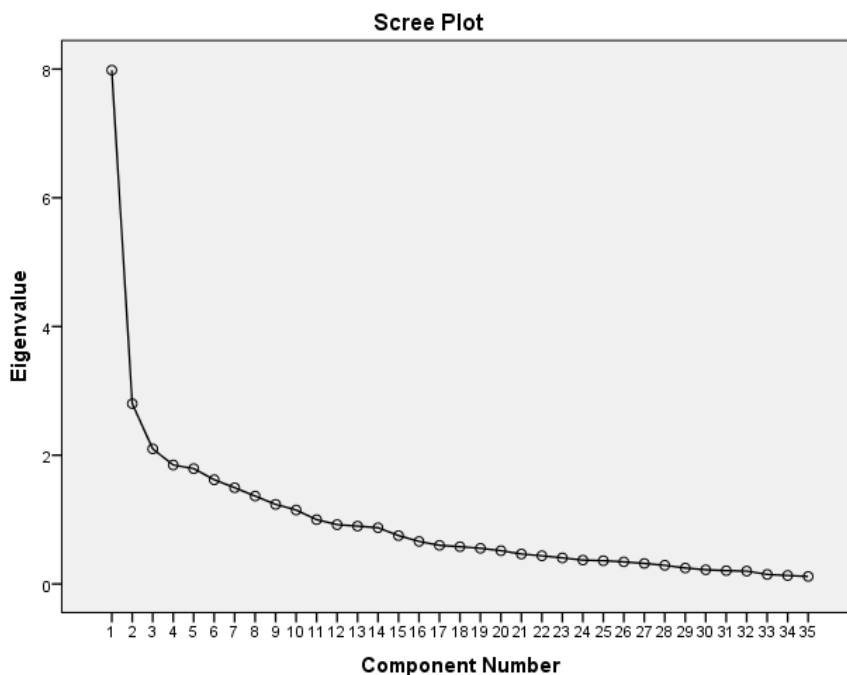


Figure 4.1: Scree Plot

In this study, an Scree Plot was created which was used to allow for the rotation of some of the factors. An Eigenvalue less than 1 suggests that components have negative reliability, Kaiser (1960). In the Scree Plot, the Eigenvalue of all components in the initial Eigenvalues were plotted, which helped to determine the optimum number of components. Components on the steep slope were extracted, while those on the shallow slope not, as they contribute little to the solution. All Eigenvalues are indicated as plotted in **Figure 4.1** above, meaning rotation of factors then allowed for the generation of the Component Matrix and further translated into a Pattern Matrix with the workable number of factors.

4.2.5. Pattern Matrix:

As can be seen in **Table 4.1** the KMO measure indicates that the sample size is adequate for factor analysis, Bartlett's test of sphericity recommends that the correlation between statements is adequate for factor analysis as well, hence results reported in the Pattern Matrix, **Table 4.4** below. The rotated component matrix as in **Section 3 of Table 4.3**, helped in determining what all components represent and generated the variables into workable factors, resulting in the Pattern Matrix.

The findings in **Table 4.4**, indicate that in terms of Transformation (Factor 1), it is found that, according to the women respondents, transformation as top of an organisation's agenda (Q1), management reminding employees of the importance of women (Q2), embracing diversity (Q3), valuing women's inputs (Q4), having conducive facilities for women in the workplace (Q5), having the privilege to take child-responsibility leave (Q21), male managers understanding that women are mothers (Q20), women involvement in decision making (Q29), good relations between female and male management (Q10), and the promotion of women (Q7) are highly correlated with Transformation in the SA mining industry. Meaning that if matters are attended to, then transformation will take place more frequently.

Dominance of male management (Q11), female managers working extra hard to prove themselves (Q8), emotional abuse from male managers (Q19), harassment from men (Q17), men thinking that women are weak (Q6), communication between women and men (Q16), care for pregnant women (Q22), relationships between female and male miners (Q9) and sexual and/or physical harassment (Q18) are connected with abuse of women (Factor 2), which means an improvement in all of these components will result in less abuse of women.

Table 4.4: Pattern matrix

PATTERN MATRIX							
No.	Statements	Component					
		Factor 1: Transfor mation	Factor 2: Female abuse	Factor 3: Clothing	Factor 4: Income	Factor 5: Development & Training	Factor 6: Other:
Q2	Management reminds employees about the importance of women in the organisation.	0.851					
Q1	Transformation is at the top of this organisation's agenda.	0.796					
Q3	Management encourages employees to embrace diversity.	0.783					
Q4	I feel that females' inputs are valued in the organisation.	0.732					
Q21	Taking child responsibility leave is a problem.	0.602					
Q5	The facilities at the organisation are conducive for women to work in.	0.515					
Q20	Male managers understand that I am also a mum with responsibilities.	0.502					
Q29	Management involves women in decision making.	0.398					
Q10	There are good relations between female and male management.	0.391					
Q7	Women get promoted more easily than men are.	0.352					
Q11	Male managers dominate the work environment.		0.601				
Q8	Women in management need to work extra hard to prove themselves.		0.577				
Q19	Male workers emotionally abuse me at times.		0.568				
Q17	Male workers harass females.		0.552				
Q6	Men in the workplace think women are weak.		0.503				
Q16	It is easy for women to communicate with men in the workplace.		0.446				
Q22	Pregnant women are moved to non-hazardous working environments		0.390				
Q9	There are good relations between female and male miners.		0.388				
Q18	I am a victim of sexual and/or physical harassment.		0.311				

Q12	The female miners' uniforms are comfortable for them to work in.			0.864			
Q13	Personal protective equipment and clothing have been designed especially for women.			0.839			
Q33	I am forced to work at the mines as the income is good.				0.709		
Q34	Given the chance, I will not work at a mine.				0.680		
Q30	I have a career development plan in place.					-0.697	
Q25	My manager is keen to approve studies for females.					-0.680	
Q31	I am on a mentorship programme.					-0.651	
Q26	The organisation offers training programmes for females.					-0.627	
Q24	My manager supports women's development in their careers.					-0.615	
Q28	Programmes are in place to address gender inequalities.					-0.293	
Q15	The toilets at the workplace are suitable for females underground.						0.554
Q23	The organisation has made changes to accommodate women.						0.450
Q14	The toilets at the workplace are suitable for females on surface.						0.661
Q32	Unions have made a difference in the improvement in the workplace for women.						0.543
Q35	I believe that there is a place for women in the mining industry.						0.434
Q27	There are more men than women on training programmes.						0.283
	<i>Extraction Method: Principal Component Analysis.</i> <i>Rotation Method: Oblimin with Kaiser Normalization.</i> <i>a. Rotation converged in 22 iterations.</i>						

The comfort of the female miners' uniforms (Q12) and the design of personal protective equipment (PPE) and clothing (Q13) are associated with Clothing (Factor 3), meaning an improvement of these components is an improvement in Factor 3.

Income (Factor 4) is linked to the good income earned at the mines (Q33), and if given the chance, women would not work at the mines (Q34).

While Development and Training (Factor 5) (D & T) are connected to career development plans (Q30), managers' approval of studies for women (Q25), being on mentorship programmes (Q31), mining organisations offering training programmes for women (Q26), management support of career development (Q24), and programmes being in place to address gender inequalities (Q28), are highly correlated. If D & T improve for women in the mining industry, then the number and roles of women in the workplace would improve.

All other components are grouped under the component "Other" and are discussed separately in the study. These include suitable underground toilets (Q15), changes made to accommodate women (Q23), suitable toilets on surface (Q14), unions making a difference in the workplace (Q32), there is a place for women in the mining industry (Q35), and more men being on training programmes (Q27). If these components improve, it would mean a better workplace for women in the industry.

The pattern matrix revealed that there are six factors of which in the "other" component, some statements need to be explained separately. These factors constitute Transformation, Female abuse, Clothing, Income, D & T, and Other. These factors are justified as per **Table 4.1**, where the factors clarify 76.4% of the total variance as per the Kaiser-Meyer-Olkin Measure of Sampling Adequacy.

4.3. RELIABILITY AND VALIDITY

According to Raimond (cited by Welman *et al.*, 2011: 45), reliability is to do with the findings of research, and it relates to the "credibility of the findings". In determining whether findings are reliable, the researcher needs to ask the following question: will the evidence and conclusions stand up to the closest scrutiny?" Welman *et al.* (2011: 142) explain validity as the "extent to which the research findings accurately represent what is happening in the situation". A test is

valid if it establishes what the researcher claims it does, while research errors such as defective research techniques, poor samples, inaccurate measurements and misleading dimensions undermine validity. While reliability predicts the uniformity of measurement or accuracy in which an instrument measures something the same way under the same condition each time, validity measures if the research accurately measures what it was intended to measure in the first place and the soundness of the research results. Simply put, does the research instrument allow aid in reaching the objective of the study? Researchers usually determine validity by seeking answers to various questions, and this can be done by research questionnaires, which is the case in this study. During the research of data gathering and analysis, there were no threats to the chosen instrument or harm brought onto any of the participants as all ethical procedures were adhered to as much as possible.

4.3.1. Reliability of factors

To test reliability, **Cronbach Alpha** is used. It is the most common measure of scale reliability for values between 0.7 to 0.8 proving as reliable.

"Kline (2009) notes that although the generally accepted value of 0.8 is appropriate for cognitive tests such as intelligence tests, for ability tests the cut-off point of 0.7 is more suitable. He goes on to say that when dealing with psychological constructs, values below even 0.7 can, realistically, be expected because of the diversity of the constructs being measured" (Field, 2009:675). Pallant suggests to report mean inter-item correlation, P100 "For scales with small number of items (e.g. less than 10) it is sometimes difficult to get a decent Cronbach Alpha value and you may wish to consider reporting the mean inter-item correlation." (Pallant, 2010: 345).

4.3.2. Reliability of data

Lee Cronbach developed Cronbach's alpha in 1951, also known as *coefficient alpha* which is a method to measure reliability and/internal consistency (Tavakol & Dennick, 2011:53-54). "Reliability" is to actually measure the credibility of the findings (Welman *et al.*, 2011: 45) and what is supposed to be measured. In this study, high reliability means consistently measuring the perceptions of women in mining, while low reliability means measuring something totally different, or even nothing at all. Cronbach's alpha is utilised to measure reliability and/ internal

consistency, of a set of items needed to be tested. Cronbach's alpha is especially used to determine if questionnaires with Likert scale questions are reliable. The questions designed to measure unobservable variables, like a person's openness which are difficult to measure; Cronbach's alpha informs the researcher if the designed test is accurately measuring the unobservable variables the researcher is interested in. To determine if the questionnaire is reliable, Cronbach's alpha of internal consistency is used as per the parameters provided in **Table 4.5** below:

Table 4.5: Cronbach's Alpha parameters

Cronbach's Alpha parameters	
Parameters (α)	Description
$\alpha \geq 0.9$	Excellent
$0.9 \geq \alpha \geq 0.8$	Good
$0.8 \geq \alpha \geq 0.7$	Acceptable
$0.69 \geq \alpha \geq 0.6$	Questionable
$0.59 \geq \alpha \geq 0.5$	Poor
$0.5 \geq \alpha \geq 0.4$	Unacceptable

Reliability refers to the strength of consistency, and extent of consistent measurement of a perception. This is computed by correlating scores for each scale item to that of the total score of each of the observations pertaining to individual survey respondents, which is then compared to individual item scores' variances. A rule of thumb for interpreting Cronbach's alpha for Likert scale questions is and $\alpha \geq 0.8$ is good while around 0.7 is acceptable and below is questionable or poor. The **Cronbach's Alpha** was utilised to show a general result of reliable data and to determine reliability statistics. Indicated in **Tables 4.6** are grouped items.

Table 4.6: Reliability Statistics

Reliability Statistics				
Factor	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	Inter-Item Correlations Mean
Transformation	0.865	0.862	10	0.385
Female abuse/ Women Abuse	0.704	0.698	9	0.204
Clothing	0.807	0.807	2	0.677
Income	0.629	0.629	2	0.459
D & T	0.776	0.778	6	0.369
Other	0.403	0.405	4	0.145

The Transformation factor has ten items for which the Cronbach's Alpha is 0.865, which is an Alpha > 0.70, meaning that these items are closely related and the variables contribute to a good and reliable set of items to be further analysed. Items grouped under the Abuse of women/ female factor indicated a Cronbach's Alpha of 0.704 (Alpha>0.70) which is acceptable and thus reliable. Items grouped under the Clothing factor indicate a Cronbach's Alpha of 0.807 (Alpha>0.70) which is good and hence reliable.

While items grouped under Income indicate a Cronbach's Alpha of 0.629 (Alpha<0.70) which is questionable. This lower alpha could be because of a low number of statements on the questionnaire, or possible poor interrelatedness between the statements or even mixed constructs and, due to this factor some are discarded.

Items in the D & T factor resulted in a Cronbach's Alpha of 0.776 (Alpha>0.70) which is acceptable and thus reliable.

Items grouped under "Other" indicates a Cronbach's Alpha of 0.403 (Alpha<0.70) which is unacceptable, thus not reliable. Therefore, these items are discussed individually, as they still have relevance to the study.

4.3.3. Scale Statistics for Reliability testing

In **Table 4.7** the descriptive statistics for Section 3 of the survey questionnaire (**Annexure 4**) are summarised.

Table 4.7: Descriptive Statistics summary

Descriptive Statistics		
	Mean	Std. Deviation
Transformation	3.11	0.87
Female/Women abuse	3.20	0.61
Clothing	2.99	1.15
Income	2.52	1.20
Development and Training	3.24	0.90
Suitable toilets on surface (Q14)	3.59	1.19
More men on training programmes (Q27)	3.81	1.20
Unions make a difference in the workplace (Q32)	3.20	1.30
There is a place for women in the industry (Q35)	4.34	1.11

The interpretation of the above table is based on a 5 point Likert scale. The 'mean' for transformation is neutral but tending towards agreeing, meaning that most of the women respondents agree that there is a need for transformation in the mining industry. For female abuse, the 'mean' is also neutral tending towards agree, which indicates that women agree that there is female abuse in the industry. Regarding clothing, most women have a neutral view tending towards disagreeing, which means that they disagree that female miners' uniforms are comfortable and most women disagree that PPE and clothing are designed especially for women. The 'mean' for income is tending towards the women disagreeing that the income in the mining industry is good and it demonstrates that women would not work at the mines if they had a choice. For D & T, the 'mean' is neutral tending towards agreeing, meaning that most women agree that there is a need for D & T in the industry for women. Most women agreed that they are suitable toilets on the surface, and most women agree that there are more men on training programmes than women. In terms of unions making a difference in the workplace for women, the 'mean' is neutral tending towards agreeing that unions do make a difference. Many women agreed that there is a place for women in the mining industry.

4.4. CORRELATION ANALYSIS BETWEEN FACTORS

In this study, the Spearman rank order correlation coefficient (Winter & Gosling. 2016), also known as the Spearman's correlation is utilised. It is a nonparametric measure, which takes into account the strength and direction of the association between two variables. Correlations are the most common techniques used for investigating relationships between quantitative variables. In this study, correlation matrixes were generated to investigate such relationships.

The correlation matrixes in **Tables 4.9, and 4.10** indicate significant correlations at the significant 2-tailed level of 0.05. Essentially statistically significant relationships are considered significant when the p-value is smaller than 0.05 and particle significant relationships are determined by the correlation coefficient (CC) which considers 0.1 as a small significant relationship; 0.3 as a significant medium relationship and 0.5 as a large significant relationship. First, the correlations are concluded among the identified factors and compared with each other in **Table 4.9 (Correlation Matrix 1)**, then identified factors are compared against the category “other” in **Table 4.10 (Correlation Matrix 2)**.

Indication in the key below factored into tables below for correlations.

KEY:	
	There are strong relationships between variables
	There are medium relationships between variables
	There are low relationships between variables
Note: ** Correlation is significant at the 0.01 level (2-tailed). Correlation Coefficient – CC key – Correlation coefficient (0.1 small, 0.3, medium, 0.5 large). * Correlation is significant at the 0.05 level (2-tailed). S – Significant- S key to indicate significance (smaller than 0.05).	

Table 4.8: Correlation Matrix 1, Factors compared with each other:

Spearman rho Rank order correlation		Transformation	Female abuse	Clothing	Income	Development & Training
Transformation	Correlation Coefficient	1.000	-.306**	.306**	-.194*	.554**
	Sig. (2-tailed)		0.000	0.000	0.030	0.000
	N	129	129	126	126	126
Female abuse	Correlation Coefficient	-.306**	1.000	-0.147	0.136	-0.070
	Sig. (2-tailed)	0.000		0.101	0.129	0.437
	N	129	129	126	126	126
Clothing	Correlation Coefficient	.306**	-0.147	1.000	-0.154	0.140
	Sig. (2-tailed)	0.000	0.101		0.086	0.119
	N	126	126	126	125	125
Income	Correlation Coefficient	-.194*	0.136	-0.154	1.000	-0.103
	Sig. (2-tailed)	0.030	0.129	0.086		0.251
	N	126	126	125	126	126
Development & Training	Correlation Coefficient	.554**	-0.070	0.140	-0.103	1.000
	Sig. (2-tailed)	0.000	0.437	0.119	0.251	
	N	126	126	125	126	126

Table 4.9: Correlation matrix 2, Factors are compared against the category “other”:

Spearman's rho Rank Order correlation		Q14 (Suitable toilets on surface)	Q27 (Men verse women on training programmes)	Q32 (Unions make a difference)	Q35 (Women have a place in mining)
Transformation	Correlation Coefficient	.294**	-0.084	.269**	.179*
	Sig. (2-tailed)	0.001	0.350	0.003	0.046
	N	125	125	123	125
Female abuse	Correlation Coefficient	-0.050	0.068	-.226*	0.068
	Sig. (2-tailed)	0.576	0.451	0.012	0.448
	N	125	125	123	125
Clothing	Correlation Coefficient	0.133	-0.084	0.112	0.086
	Sig. (2-tailed)	0.139	0.353	0.218	0.345
	N	125	124	122	124
Income	Correlation Coefficient	-0.163	0.127	0.002	-.273**
	Sig. (2-tailed)	0.071	0.158	0.981	0.002
	N	124	125	123	125
Development & Training	Correlation Coefficient	0.134	-0.163	0.156	0.174
	Sig. (2-tailed)	0.138	0.070	0.085	0.053
	N	124	125	123	125

Correlation results of Table 4.8:

There is a negative correlation (CC -0.306) between transformation and female abuse, which indicates that according to the women respondents, the more female abuse there is in the industry, the less the women feel positive towards transformation. There is a positive and medium (CC 0.306) relationship between clothing and transformation, which means that the more effort taken to design PPE and clothing for women miners, the more improvement towards transformation there is in the industry. Correlation is significant between income and transformation (S 0.030), meaning that as women's income improves so too will transformation. The correlation between D & T and transformation is strong, which means that women feel that the more D & T is provided for women in the industry, the greater the stride made towards transformation.

Correlation results of Table 4.9:

The results of the table is interpreted next. There is medium (CC 0.294) correlation between transformation and suitable toilets for women on the surface, meaning that most women respondents felt that if there are suitable toilets for women on the surface in the industry, then there is an improvement towards transformation. There is also a medium (CC 0.269) correlation between transformation and unions making a difference in the workplace, meaning that the more unions are involved, the more they make a difference towards improving transformation. There is a significant (S 0.046) correlation between transformation and women having a place in the industry; this means that the more transformation takes place towards women in mining, the more women feel that there is a place in the industry for them. There is a medium and negative (CC-.273) correlation between income and women having a place in the mining industry, which means that the high income level keeps women in the industry, but if they had other opportunities to earn a similar income they would work elsewhere. There is a strong significance (S 0.053) between D & T and women having a place in the industry; this means that the more D & T is provided for women in the industry, the greater the retention of women and the more women feel they have a place in the industry.

4.5 COMPARISON WITH BIOGRAPHICAL VARIABLES

In this study, the *Spearman rank order* correlation matrixes were generated to investigate such relationships between ordinal biographic variables and factors.

Table 4.10: Correlation matrix 3, Factors and “other” compared against relevant Bios

Spearman's rho Rank order correlation		BIO1 (Age)	BIO4 (Qualification)	BIO5 (Level of Employment)	BIO7 (No. of years in industry)	BIO8 (Current earnings)
Transformation	Correlation Coefficient	0.068	0.096	0.168	0.062	.214*
	Sig. (2-tailed)	0.446	0.281	0.062	0.493	0.018
	N	127	128	124	126	122
Female abuse	Correlation Coefficient	0.004	0.153	0.144	0.083	.186*
	Sig. (2-tailed)	0.965	0.086	0.109	0.353	0.040
	N	127	128	124	126	122
Clothing	Correlation Coefficient	-0.003	-0.037	0.008	0.053	0.011
	Sig. (2-tailed)	0.976	0.686	0.935	0.561	0.908
	N	124	125	121	123	119
Income	Correlation Coefficient	0.027	0.064	-0.056	0.039	0.020
	Sig. (2-tailed)	0.770	0.477	0.538	0.669	0.830
	N	124	125	121	123	119
Development and Training	Correlation Coefficient	-0.031	0.054	0.150	-0.001	.202*
	Sig. (2-tailed)	0.736	0.547	0.100	0.988	0.028
	N	124	125	121	123	119
Suitable toilets for women on surface (Q14)	Correlation Coefficient	0.003	.179*	.180*	.187*	0.155
	Sig. (2-tailed)	0.978	0.047	0.050	0.039	0.094
	N	123	124	120	122	118
Men verse women on training programmes (Q27)	Correlation Coefficient	-0.006	0.094	0.052	0.016	-0.018
	Sig. (2-tailed)	0.949	0.296	0.571	0.859	0.849
	N	123	124	120	122	118
Unions make a difference (Q32)	Correlation Coefficient	0.068	-0.159	-.248**	0.020	-0.154
	Sig. (2-tailed)	0.460	0.080	0.007	0.828	0.097
	N	121	122	118	120	117
Women have a place in mining (Q35)	Correlation Coefficient	0.133	0.081	0.102	0.133	.237**
	Sig. (2-tailed)	0.142	0.372	0.269	0.143	0.010
	N	123	124	120	122	118

The findings in **Table 4.10** above are indicated below.

As much as there is a low correlation between qualification and suitable toilets for women on surface operations, there is a significant relationship between the two variables. According to the women respondents, the higher qualified women are, the more likely they are to be employed on the surface where the toilets are suitable for women, while this may not be the case for women with lower levels of qualification, such as women miners who work underground.

There is also a significant relationship between the level of employment of women in the industry and suitable toilets on the surface. This could mean that the higher the level of employment of the women, the more likely she is to work on the surface and have better toilet facilities, which may not be the case for women who have lower qualifications as they tend to work as miners underground and their toilets are not suitable for women's needs.

There is a negative significant correlation between the level of employment and unions making a difference in the workplace. Being on a certain level of employment does not mean that the union will not make a difference to a women's work environment.

There is a significance between the number of years a woman is employed in the industry and suitable toilets on the surface, meaning that women who have been working on the mines for a longer time period of time have access to suitable toilets.

Transformation and current earnings have a significant relationship. The higher the women's earnings, the higher level of transformation in the mining industry.

A significant relationship exists between female abuse and current earnings. The women who earn higher salaries experience less female abuse.

There is a significant relationship between D & T and current earnings. The more D & T provided to women, the greater their potential for earning higher salaries.

There is a significant correlation between women having a place in the industry and current earnings. The higher the women's earnings, the more they feel that they have a place in the industry.

4.5.1 Independent Samples t-Tests

A t-test is an analysis of population means by utilising statistical examination, which tests the difference between the samples. Indicated in this section are the T-test results for biographical variables for all factors against Race group (**Table 4.11**), Geographical dispersion at work (**Table 4.12**), and Union affiliation (**Table 4.13**). These results are further analysed below each table.

“Statistical significance tests have a tendency to yield small p-values (indicating significance) when the size of the data sets increases. The effect size is independent of sample size and is a measure of practical significance”, and for effect size consider, small effect: $d=0.2$, medium effect: $d=0.5$ and large effect: $d=0.8$, also consider “data with $d>0.8$ as practically significant, since it is the result of a difference having a large effect” (Ellis & Steyn 2003: 51-53). For this study effect size is utilised and p-values are shown for relevance only.

Table 4.11: T-Test Results based on Race

Group Statistics: Race						
Black = All black participants. All other = Indian, Coloured and White.		N	Mean	Std. Deviation	P-value	Effect size
Transformation	Black	104	3.0577	0.85574	0.153	0.32
	All other	25	3.3493	0.90493		
Female abuse	Black	104	3.2456	0.58961	0.215	0.27
	All other	25	3.0600	0.67504		
Clothing	Black	101	2.9604	1.17193	0.570	0.12
	All other	25	3.1000	1.07044		
Income	Black	101	2.5842	1.17701	0.233	0.27
	All other	25	2.2400	1.29196		
Development & Training	Black	101	3.2234	0.86674	0.747	0.07
	All other	25	3.2960	1.03075		
Suitable toilets on surface (Q14)	Black	101	3.630	1.189	0.434	0.18
	All other	24	3.420	1.213		
Men versus women on training programmes (Q27)	Black	100	3.750	1.250	0.203	0.23
	All other	25	4.040	0.935		
Unions make a difference (Q32)	Black	100	3.210	1.297	0.917	0.02
	All other	23	3.170	1.527		
Women have a place in mining (Q35)	Black	100	4.270	1.136	0.146	0.29
	All other	25	4.600	0.957		

In **Table 4.11** above, the racial groups of the women respondents are categorised on Black and All other. There was no statistical or practical difference when factor scores were analysed according to race, hence no significance.

In terms of 'means', both the Black and the All Other groups tend to agree that there is a need for transformation, and female abuse exists at the mines. Both groups tend to agree that D & T is needed for women at the mines and both tend to agree that the toilets on the surface are suitable for women. The Black group tends to agree that there are more men on training programmes than women while the All Other group disagrees. Both groups tend to agree that unions make a difference in the workplace and both groups agree that there is a place for women in the mining industry.

Table 4.12: Geographical dispersion at work

Group Statistics BIO12 (Geographical dispersion at work)							
1=Open pit. 2= Deep mining/underground mine.		N	Mean	Std. Deviation	Std. Error Mean	P-Value	Effect size
Transformation	Open Pit	55	3.2189	0.86594	0.11676	0.123	0.30
	Deep mining/ underground mine	48	2.9397	0.94317	0.13614		
Female abuse	Open Pit	55	3.1487	0.68500	0.09237	0.394	0.15
	Deep mining/ underground mine	48	3.2520	0.53864	0.07775		
Clothing	Open Pit	55	3.0636	1.01404	0.13673	0.475	0.13
	Deep mining/ underground mine	47	2.8936	1.32672	0.19352		
Income	Open Pit	54	2.5556	1.26888	0.17267	0.568	0.11
	Deep mining/ underground mine	47	2.4149	1.19927	0.17493		
Development and Training	Open Pit	54	3.2642	0.87991	0.11974	0.624	0.09
	Deep mining/ underground mine	47	3.1730	0.97157	0.14172		
Suitable toilets for women on the surface (Q14)	Open Pit	54	3.78	1.093	0.149	0.198	0.24
	Deep mining/ underground mine	47	3.47	1.283	0.187		
Men versus women on training programmes (Q27)	Open Pit	54	3.85	1.309	0.178	0.544	0.11
	Deep mining/ underground mine	47	3.70	1.159	0.169		
Unions make a difference (Q32)	Open Pit	52	3.17	1.396	0.194	0.429	0.16
	Deep mining/ underground mine	46	3.39	1.325	0.195		
Women have a place in mining (Q35)	Open Pit	53	4.40	1.044	0.143	0.540	0.12
	Deep mining/ underground mine	47	4.26	1.224	0.179		

In **Table 4.12** above, there was no statistical or practical difference when factors scores were analysed according to Geographical Dispersion (Bio 12) at work was classified in terms of effect size or P-values, hence no significance.

In terms of 'means', and based upon data provided by the women respondents, more women from open-pit mines tend to agree that there is a need for transformation in the industry. Women working in both open-pit and deep mining/underground mines tend to agree that female abuse is present at the mines in SA. Women working in open-pit mines tend to agree more that

there is a need to improve PPE and clothing for women miners. Both groups tend to agree that there is a need for more D & T for women in the industry.

With regard to having suitable toilets for women on the surface, both groups tend to agree that the toilets on surface of the mines are suitable for women. Both groups also tend to agree on the following three issues: there are more men than women on training programmes, unions make a difference in the improvement in the workplace, and women have a place in mining.

Table 4.13: Union affiliation

Group Statistics BIO13 (Union affiliation)							
1=Yes 2=No		N	Mean	Std. Deviation	Std. Error Mean	P-Value	Effect size
Transformation	Yes	70	2.9677	0.92332	0.11036	0.060	0.31
	No	54	3.2581	0.77559	0.10554		
Female abuse	Yes	70	3.1996	0.62204	0.07435	0.619	0.09
	No	54	3.2544	0.59506	0.08098		
Clothing	Yes	68	2.8971	1.14787	0.13920	0.403	0.15
	No	54	3.0741	1.16314	0.15828		
Income	Yes	69	2.4565	1.16549	0.14031	0.362	0.16
	No	53	2.6604	1.25871	0.17290		
Development and Training	Yes	69	3.1338	0.95043	0.11442	0.166	0.24
	No	53	3.3597	0.83654	0.11491		
Suitable toilets on surface (Q14)	Yes	68	3.46	1.309	0.159	0.129	0.24
	No	53	3.77	0.974	0.134		
Men versus women on training programmes (Q27)	Yes	69	3.77	1.296	0.156	0.855	0.03
	No	52	3.81	1.085	0.151		
Unions make a difference (Q32)	Yes	68	3.59	1.352	0.164	0.000	0.64
	No	51	2.73	1.168	0.163		
Women have a place in mining (Q35)	Yes	69	4.26	1.208	0.145	0.421	0.13
	No	52	4.42	0.997	0.138		

In **Table 4.13:** above, there was very limited statistical or practical difference when factors scores were analysed according to Union Affiliation in terms of effect size or P-values, hence not much significance. Q32 which is “Unions have made a difference in the improvement in the workplace for women”, see **Annexure 4**, is significant in terms of the p-value and effect size.

When considering the 'mean', it was found that in terms of the data provided by the women respondents, women belonging to a union agreed more 'that unions have made a difference in the improvement in the workplace for women' than those not belonging to a union did.

Regarding the 'mean', more women who do not belong to a union feel that there is a need to improve transformation in the mining industry in SA. Both those women who belong to a union and those who do not belong to a union tend to agree that female abuse takes place at the mines. Both groups tend to agree on the following issues: that there is a need for D & T for women, that the toilets for women on surface operations are suitable, that there are more men than women on training programmes and that there is a place for women in the industry in SA. Those women that belong to a union tend to agree that unions make a difference in the workplace. Both groups agree

4.6. CHAPTER SUMMARY AND CONCLUSIONS

In this chapter, the statistical data analysis was concluded. The empirical findings regarding 'The perceptions of women in the workplace in the South African mining industry' were presented and discussed. Quantitative data was presented in an integrated manner according to relevant matter in table format. A factor analysis was concluded to explore the factorial structure. Reliability statistics were reported per factor, while descriptive statistics reported per factor with 'means' and standard deviations. Correlation analysis between factors and comparisons with biographical variables were explored using 'means' and standard deviation'.

The findings showed that most women respondents agree that there is still a need for transformation within the SA mining industry, and that embracing diversity, valuing female inputs, having conducive facilities for women in the workplace, women's involvement in decision making and the promotion of women should not be ignored. To retain women in the mining industry, mining companies must be sensitive to the needs of women, such as acknowledging that women are mothers and that they need to take child-responsibility leave. Gaps exist in male counterparts' understanding of women's needs in the workplace and much work still needs to be done to ensure that mining companies put transformation at the top of their agenda. In comparison with biographical variables (**Section 4.5**), it was found that the more unions are involved, the more they make a difference towards the improvement of transformation, and that the higher the earnings of the women, the greater their experience of transformation in the mining industry. All racial groups agree that there is a need for transformation, while more women from open-pit mines agree that there is a need for transformation than those employed in deep mining/underground mines.

The study also found that most women respondents agree that there is female abuse in the SA mining industry. Female abuse constitutes the following: dominance and emotional abuse by male management, female managers having to work extra hard to prove themselves, men thinking that women are weak, and sexual and/or physical harassment by their male counterparts. Improvement in all of these areas will result in less female abuse. It was also found that the more female abuse there is in the industry, the less the women feel positive towards transformation. The analysis of the biographical variables (**Section 4.5**), indicated that all racial groups, women working in open-pit and deep mining/underground mine and women who belong and do not belong to unions felt that female abuse exists in the industry. Mining companies need to take actions to reduce female abuse in the industry as a whole.

Regarding clothing, the empirical research shows that most women respondents tend to have a neutral view towards disagreeing that female miners' uniforms are comfortable and most women disagree that PPE and clothing are designed especially for women. The design and making female miners' uniforms and PPE more comfortable for women is something to be looked into by mining companies. When looking at the correlation analysis between factors, in **Section 4.4**, it was found that there is a positive and medium relationship between clothing and transformation, which means that the more effort that is taken to design appropriate PPE and clothing for women miners, the greater the improvement towards transformation in the industry. **Section 4.5** indicates that women who work at open-pit mines tend to agree more that there is a need to improve PPE and clothing for women miners.

It was found that most women respondents agree that the income in the mining industry is good and this demonstrates that women would not work in the mines if they had a choice of earning a similar income elsewhere. There is a significant correlation between income and transformation (**Section 4.4**), meaning that when the income of women improves so too will transformation and that the higher income keeps women in the industry, but if they had other opportunities they would work elsewhere (**Section 4.4**).

The findings show that for D & T (**Section 4.3**) most women respondents agree that there is a need for D & T for women in the mining industry. D & T is linked to career development, management approval of studies, mentorship programmes and career development. If D & T for women improves in the mining industry, then the position of women in the workplace would improve. In **Section 4.4**, it indicates that the correlation between D & T for women and transformation is strong, which means that women feel that the more D & T is provided for women in the industry, the greater the strides that will be made towards transformation. There is a strong significance between D & T for women and women having a place (being recognized) in the industry, which means that the more D & T is provided for women in the

industry, the more women will have a place in the industry which will result in a higher level of retention for women. It was also found that the more D & T is provided for women, the greater their potential to earn a higher income (**Section 4.5**). Both racial groups (Black and All Other) tend to agree that D & T is needed for women at the mines, while women working at open-pit and deep mining/underground mines as well as those belonging to, or not belonging to, a union agree that D & T is needed for women.

Most women respondents agreed that there are suitable toilets for women on the surface of mines (**Section 4.3**). There is a correlation between transformation and suitable toilets for women on the surface (**Section 4.4**), meaning that most women feel that if there are suitable toilets for women on the surface in the industry that there is also an improvement towards transformation. The women who earned the higher salaries felt that the toilets for women on the surface were suitable, while lower earners did not feel the same. There is also a significant relationship between the level of employment of women in the industry and their perception of the suitability of toilets on the surface. This fact could mean that the higher the level of qualifications/employment of the women, the more likely they are to work on the surface and thus have appropriate toilets. However, this may not be the case for women who have lower qualifications because they tend to work as miners underground where their toilets are not suitable for the needs of women.

It was found that there are more men on training programmes than women. Mining companies should not ignore this fact, and in order to guarantee transformation, they should ensure that more women attend D & T programmes. It should be remembered that the development of women in the mining sector is critical to achieve employment equity targets, which is a requirement of the Mining Charter.

In terms of unions making a difference in the workplace for women, most of the women agree that unions do make a difference to the workplace.

Many of the women respondents agreed that there is a place for women in the mining industry.

The findings revealed concerns pertaining to the perceptions of women in the SA mining industry in terms of transformation, comfortable PPE and clothing for women, recognition, training and development opportunities and mentorship for women and differences in income levels between men and women. Mining companies in SA must take cognisance of the fact that these concerns need to be addressed in line with the requirements of the revised Mining Charter, to ensure transformation in the mining industry as a whole and for the retention of women in the industry.

The next chapter covers the study.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION

The objective of Chapter 5 is to present the concluding remarks with recommendations, based on the findings of this study. Chapter One covered the nature and scope of the study, giving an outline of the research undertaken and the reasons for such a study. Chapter Two reviewed literature which provided the theoretical and legislative context of the study. Chapters Three and Four provided the empirical findings that had been inferred from data based on the theoretical and legislative context set out in Chapter Two. Chapter Five concludes the study and reiterates the research problem and study objectives, followed by the conclusions drawn from the empirical findings, together with recommendations for future research. This chapter ends with a summary of the research project.

5.2. RESEARCH PROBLEM & OBJECTIVES

As indicated in Chapters One and Two, the MPRDA and the Mining Charter of 2002 seek to address the imbalances in the SA mining industry and to rectify the inequalities that still exist in the workplace. The Mining Charter required the inclusion of women in core mining activities to be at 10% by 2009. In addition to this, the 2010 amended Mining Charter required an employment equity target of 40% for HDSA in core skills by 2014. As outlined in the Abstract, the requirements of the Reviewed Mining Charter of 15 April 2016 in terms of EE, are a 15% representation of Black women with exercisable voting rights at executive management board level, 25% at director level, 30% at senior management level, 38% at middle management level and 44% at junior management level. However, despite the SA Government's good intentions, gender equality in the mining industry continues to be a challenge and women do not have pleasant working environments, as can be seen from information provided in the literature review and the findings of the empirical research.

As mentioned in Chapter 1 (section 1.4), the primary objective of this research study is to gauge the perceptions of women in the workplace in the mining industry, specifically in SA and how this impacts on these women. While the secondary objectives outlined in Chapter 1 (section 1.4) of the study are:

- To better understand what women working within the mining industry experience every day;

- To determine what the main problems are for women in the mining industry;
- To make the mining industry's management aware of the challenges women face in their workplace on a daily basis, so that these working conditions can be improved;
- To suggest improvements in the workplace of women working in the mining industry, through the Annual Women in Mining Conference, WIMSA (Women in mining South Africa), COM (Chamber of Mines) and DMR (Department of Minerals);
- To determine if mining is still considered a so-called "man's world";
- To do determine gender inequalities within the mining industry;
- To determine if there are salary discrepancies between male and females within the mining industry;
- To determine the psychological well-being of women in the workplace in the mining industry; and
- To determine turnover intention of the women in the mining industry;

The author's intention was for these objectives to help answer the following question as mentioned in Chapter 1 (section 1.4):

- What should be improved or changed in the SA mining industry to allow for women to increase and improve their presence and performance in the workplace? and
- To make recommendations to the SA mining industry and recommendations for future research.

The following **Limitations** were encountered during the study:

- The ratio of women working underground compared to those working on the surface is 6% versus 66%.
- The participants in this study were drawn from only six of the nine SA provinces.

Research methodology:

The research methodology included a literature review and an empirical study, which proved to be appropriate and adequate for the study, based on the following conclusions:

The literature review provided the framework for the study and featured aspects common to the mining industry both globally and in SA. It also provided a comprehensive understanding of the problems women encounter in the mining industry, which made it easier for the researcher to understand the variables that affect women in their work place in this industry. The questionnaire was developed based on the literature review which indicated what type of statements should be captured in the questionnaire. Hence a thorough literature study was an essential prerequisite for creating the questionnaire as this study's major research tool.

Quantitative data which was obtained via questionnaires, and the statistical analysis thereof, confirmed the validity of the specified constructs through deductive reasoning. The constructs include transformation, female/women abuse, clothing, income and development and training amongst others.

The measure of sampling adequacy, viability and reliability for analysis was conducted using KMO, Bartlett's test of sphericity and Cronbach's alpha coefficient which established the validity of the research tool (questionnaire) as a reliable data collection instrument (see Chapters Three and Four).

Regarding **Ethics**, every possible measure was undertaken by the researcher to ensure deployment of ethical research methodology. Honesty and integrity were maintained throughout the research study, and to ensure that no participant was adversely affected in any way, a covering letter was attached to the questionnaire, stating that the participant was under no obligation to partake in the empirical research process and that no names were required thus assuring confidentiality, see **Annexure 4**. The researcher also obtained prior permission from the company (ITC) who hosts the Annual Women in Mining Conference to distribute the questionnaires to the participants of this conference which took place on 22 February 2017 (see **Annexure 3A**) to avoid any legal problems. Bias was avoided in the research design, data analysis and the interpretation thereof. The North-West University Statistic Consultation Service analysed the data and assisted with the interpretation of the results (see **Annexure 5**). Care has been taken to ensure that all the questionnaires are retained to prove the validity of the data obtained from these questionnaires for this research study. To ensure the English language was utilised in the best way possible, a language editor was utilised (see **Annexure 6**). Every effort was made not to plagiarise or copy other authors' work. Where the work of others has been used, it has been referenced in line with the NWU Referencing Guide in Harvard style and format. No harm was caused to any of the parties or persons involved in making this research project possible.

In the next section conclusions are drawn, based on the findings, and relevant recommendations are made.

5.3 CONCLUSIONS AND RECOMMENDATIONS

Indicated below are the Conclusions and Recommendations of the study.

Conclusion 1:

The literature research in Chapter 2 found that the challenges which women face in the SA mining industry are still austere and if not attended to, could have severe implications economically and socially, as well as delay the transformation of this industry. Chapter 2 also confirmed that there is still a great need to improve the policies relating to the treatment of women regarding sexual harassment, PPE and clothing, maternity leave and family responsibility.

Recommendation1:

Stronger enforcement of legal frameworks and greater awareness of current problems facing women is needed within the mining industry as a whole, as well as within specific mining companies. This enforcement will reduce the turnover intention of women in the industry and ultimately contribute to transformation.

Conclusion 2:

The research indicated that only 6% of the women employed in the mining industry work underground, while the MPRDA and Mining Charter required the figure to be 10% in 2009.

Recommendation 2:

The Department of Minerals needs to be more active in checking that mining houses comply with the relevant legislation. Mining houses can also encourage women to work in core fields by providing funding to enable them to undertake studies in these core fields and also promoting these fields at career expos and becoming more involved in campaigns which encourage women to seek employment in what are regarded as 'male-dominated workplaces', such as "take a girl child to work", which is a South African initiative to encourage and empower women to take-up careers in male-dominated occupations.

Conclusion 3:

Chapter 3 and 4 of the study confirmed that most women agree that **transformation** within the SA mining industry is essential, and the need for embracing diversity, encouraging women's involvement in decision making and promoting women to senior positions, respecting women's inputs and ensuring conducive toilet facilities for women in the workplace, should not be ignored by those involved in all levels of mine management. In addition to this requirement, it was noted in Chapter 3 that men in the mining industry think that women are weak, male managers continue to dominate the industry, women are promoted less than men and women in management positions have to work harder than their male counterparts to prove themselves. Although most women, if given a chance of alternative employment, would not work on a mine, 83% of women still believe that "there is a place for women in the mining

industry". This study also confirmed that most unions have a positive influence on transformation.

Recommendation 3:

To retain women in the industry, mining companies should be sensitive to women's needs, by placing transformation at the top of their agendas. Mining companies need to have awareness campaigns to promote women in the industry which could change the mindset of men in the industry to one in which they accept that there is a place for women in the mining industry. Awareness campaigns could include posters, men being invited to Women's Day celebrations and management actively showing that women play a valuable role in the industry.

Conclusion 4:

Most women agree that female abuse still exists in the SA mining industry, which includes male management dominance, male managers emotionally abusing women, women in managerial positions having to prove their competency by working extra hard, and men assuming that women are weak and physically and/or sexually harassing them. It was confirmed that women feel less positive towards the progress of transformation in the mining industry because of the continued existence of female abuse. In Chapter 3 of *the study*, it was also noted that while pregnant women employees are moved to non-hazardous environments in the industry, 33.1% struggle to obtain child responsibility leave.

Recommendation 4:

Action needs to be taken by mining companies to ensure that the abuse of women employees in the workplace is minimised or eradicated. Men working in the mining industry need to participate in training programmes that will discourage them from harassing women emotionally, sexually and/or physically. Awareness campaigns related to harassment issues need to be implemented by Human Resource Departments and much harsher punishments applied to offenders.

Mining companies need to employ more women in management positions to reduce male-management dominance in the industry, and also train and develop female workers in managerial positions. Mining companies also need to allow women child-responsibility leave because women are generally responsible for the care of their children.

Conclusion 5:

The study found that PPE and female miners' uniforms and protective **clothing** are uncomfortable for women to work in and that improvements to both the women's PPE and protective clothing contribute towards transformation.

Recommendation 5:

Mining companies need to ensure that the design of PPE and female miners' protective clothing is shaped for a women's body thus making them comfortable for women to work in. Mining companies should request that this redesigning process is carried out by the companies who supply the PPE and protective clothing. Both the COM and the DMR need to set regulations regarding these items.

Conclusion 6:

The study confirmed that women earn less than men in the mining industry, and that, if women had a choice, they would not work in this industry. The study also found that improving the income of women will contribute towards greater transformation and retention of women in the industry.

Recommendation 6:

It is recommended that mining companies ensure that women who fulfil similar roles to those of their male counterparts, should be placed on the same salary grading.

Conclusion 7:

The findings show that there are more men than women participating in D & T programmes and that there is a need for D & T programmes for women in the mining industry (Chapters 3 and 4). The study also found that if D & T for women is improved, then the transformation will improve which will result in greater retention of women in the industry than currently. It also found that the potential for women to earn higher salaries is linked to an increase in D & T initiatives.

Recommendation 7:

As stated in **Section 4.5** of Chapter 4, "the development of women in the mining sector is a critical factor in achieving the employment equity targets set by the Mining Charter". D & T is connected to career development, mentorship and promotion, which means higher earning power for women. Higher earnings will result in the retention of women in the industry. To achieve retention, it is recommended that mining companies increase their D & T programmes designed especially for women and also increase the number of women participants in all D & T programmes.

Conclusion 8:

The study found that there are suitable toilet facilities on the surface of mines (Chapter 4) for women who are classified as 'higher earners', while the 'lower earners', who mostly work underground, do not have appropriate toilet facilities (Chapter 3).

Recommendation 8:

There is only a limited number of women who work underground in the mining industry and to retain them, mining companies need to improve the underground toilet facilities for women.

The primary and secondary objectives of the study have been addressed in this section. The next section addresses one of the more specific objectives of the study which is to make recommendations for future research.

5.4. RECOMMENDATIONS FOR FUTURE RESEARCH

To ensure transformation, improvements in women's work environments and the retention of women employees, as well as improving their perceptions of the SA mining industry, the following ideas are suggested for future research studies:

1. A study of this nature is conducted on an annual basis as longitudinal studies targeting the participants of the Annual Women in Mining Conference to measure improvements made to the working conditions of women in the mining industry. The results of this research should be presented to the DMR and COM.
2. Research can be conducted to explore the specific challenges experienced by women employed in managerial positions on mines and well as by women working underground.
3. In-depth research should be conducted to determine the conditions that would retain women in the industry.
4. Research should be conducted on female learners who are exiting school at matric level, to determine if they wish to study mining-related courses at tertiary institutions and, if they are not, the reasons for their lack of interest.
5. Studies should be conducted on the men employed in the mining industry to discover their attitude towards women employees, at all levels, in the mining industry and what can be done to change their perceptions of these women.

5.5. SUMMARY OF RESEARCH STUDY

Based on the literature study, it is evident that there is limited research and literature on "the perceptions of women in the workplace in the South African mining industry". It is also evident that women are still experiencing challenges in the workplace in spite of the numerous legislative acts that have been implemented in SA since 2002.

The primary objective of this research study which was to gauge the “perceptions of women in the workplace in the mining industry, specifically in SA and how it impacts these women”, has been achieved as can be seen in the conclusions set out above. To meet the primary objective, the specific secondary objectives were achieved through the five chapters.

Chapter One delineated the nature and scope of the study by providing an introduction to the research, outlining the problem statement and research questions, as well as the primary and secondary objectives of the study. Furthermore, the scope of the study, together with its research methodology, limitations, contributions and study layout were defined and discussed.

Chapters Two provided the literature review and theoretical framework for the study, which included gender or sex inequality, an overview of mining legislation about women and the perspectives and trends in both the SA and global context. This gave rise to the understanding of the variables which impact women in the workplace specifically in the mining industry.

Chapters Three and Four provided the empirical findings against the backdrop of the theoretical framework of Chapter Two.

Chapter Five completed the study and provided the essential conclusions with recommendations in line with the research objectives. It also provided recommendations for future research.

The findings revealed concerns about the perceptions of women in the SA mining industry. It is imperative that mining companies, the DMR and the COM take cognisance of the fact that these concerns need to be addressed if transformation about women’s role in the mining industry is to be achieved.

BIBLIOGRAPHY

Allen, N.J. & Meyer, J.P. 1990. The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology*, 63/64:1-19.

Amponsah-Tawiah, K., Mensah, J. & Ntow, M.A.O. 2015. Occupational Health and Safety Management and Turnover Intention in the Ghanaian Mining Sector. *Safety and Health at Work*, 7(2016),12e-17e.

Anon. 2010. South Africa's new mining charter.

<http://www.southafrica.info/business/economy/policies/miningcharter-140910.htm> Date of access: 29 Sep. 2016.

Anon. 2014. Women in Mining face challenges. *Inside Mining*, 6:30

Anon. 2017a. Chamber seeks interdict against new mining charter. IOL News, 26 June 2017. <http://www.iol.co.za/news/chamber-seeks-interdict-against-new-mining-charter-9982794> [Date of access: 26 July 2017]

Anon. 2017b. #BreakingNews: Zwane halts implementation of mining charter. IOL News, 14 July 2017. <http://www.iol.co.za/business-report/markets/commodities/breakingnews-zwane-halts-implementation-of-mining-charter-10291952> Date of access: 26 Jul. 2017.

Anon. 2017c. NUM 'shocked' after Mining Charter put on hold. IOL News, 14 July 2017. <http://www.iol.co.za/news/politics/development/num-shocked-after-mining-charter-put-on-hold-10294898> Date of access: 26 Jul. 2017.

Ansfield, J. (Ed.). 2016. The transformation mandate: Leadership imperatives for a hyperconnected world. <http://www.heidrick.com/~media/Publications%20and%20Reports/The-Transformation-Mandate.pdf> Date of access: 31 July 2017.

Babbie, E. & Mouton, J. 2011. The practice of social research. Cape Town: Oxford University Southern Africa.

Bell, D., Chapman, P.R., Cheng, Y. & Groysberg, B. 2016. The 2016 Global Board of Directors survey. Boston, MA: Spencer Stuart for the Women Corporate Directors Education and Development Foundation.

Bernstein, C. & Osman, R. 2016. Positives and negatives. Reconceptualising gender attributes within the context of the sex-role identity and well-being literature: an examination within the South African context. *SA Journal of Industrial Psychology*, 42(1):1-2.

Bernstein, C. & Volpe, S. 2016. The implications of sex-role identity and psychological capital for organisations: A South African Study. *SA Journal of Industrial Psychology*. 0258(5200): 2.

Bobo, L. & Suh, S.A. 1995. Surveying racial discrimination: analyses from a multiethnic labor market. Working Paper #75. New York, NY: Russell Sage Foundation.

Botha, D. 2013. Women in mining: a conceptual framework for gender issues in the South African mining sector. Potchefstroom Campus: NWU. (Thesis – PhD).

Botha, D. 2016. Women in mining still exploited and sexually harassed. *SA Journal of Human Resource Management*. 14(1):1-12.

Botha, D. 2016. Women in mining: engaging men in the dialogue. *Journal of Contemporary Management*, p. 954, SA ePublications Service, EBSCOhost, viewed 22 February 2017.

Botha, D. & Cronje, F. 2015. Occupational health and safety considerations for women employed in core mining positions: original research. *SA Journal of Human Resource Management*, 13(1):1-12.

Bryman, A., Bell, P., Hirschsohn, E., Dos Santos, A., Du Toit, J., Masenge, A., Van Aardt, I. & Wagner, C. 2015. Research Methodology: Business and management contexts. Cape Town: Oxford University, South Africa.

Campbell, K. 2007. Woman miners “No better industry”, but retaining women after recruiting them seen as challenge. *Mining Weekly*, 115(8):8.

Chamber of Mines (COM) of South Africa. 2016. Mine SA 2016 facts and figures pocketbook. https://www.google.co.za/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&cad=rja&uact=8&ved=0ahUKEwjz_dDdzrLSAhVIB8AKHcnXCCAQFgg1MAM&url=http%3A%2F%2Fwww.chamberofmines.org.za%2Findustry-news%2Fpublications%2Ffacts-and-figures%2Fsend%2F17-facts-and-figures%2F390-facts-and-figures-2016&usg=AFQjCNFUWBrS4nydVRlqK2CZzTT-N_gNrQ&bvm=bv.148073327d.d24 [Date of access: 27 July 2017]

Crawford, J.B. & Mills, A.J. 2011. The formative context of organizational hierarchies and discourse: implications for organizational change and gender relations. *Gender, Work and Organization*, 18(S1):e89-e106.

De Klerk, I. 2012. The perceptions of the work environment of women in core mining activities, (Mini-dissertation – MBA). Potchefstroom: North-West University.

Dludla, S. 2017. Minister defends new Mining Charter. IOL News, 22 June 2017.
<http://www.iol.co.za/news/politics/development/minister-defends-new-mining-charter-9917115>
Date of access: 12 July 2017.

Els, C., Rothmann, S. (Jr) & Van Schalkwyk, L. 2011. The moderating role of perceived organisational support in the relationship between workplace bullying and turnover intention across sectors in South Africa. *SA Journal of Human Resource Management*, 9(1):384-397.

Fauconnier, A. & Mathur-Helm, B. 2008. Black economic empowerment in the South African mining industry: A case study of Exxaro Limited. *South African Journal of Business management*, 39(4):4.

Field, A. 2005. Discovering statistics using SPSS. 2nd ed. London: Sage.

Field, A. 2009. Discovering statistics using SPSS. 3rd ed. London: Sage.

ILO (International Labour Organisation). 2011. Equality at work: The continuing challenge.
http://www.ilo.org/ilc/ILCSessions/100thSession/reports/reports-submitted/WCMS_154779/lang--en/index.htm [Date of access: 31 July 2017].

ILO (International Labour Organisation). 2012. C045 - Underground Work (Women) Convention, 1935 (No. 45).
http://www.ilo.org/dyn/normlex/en/f?p=1000:12100:0::NO::P12100_INSTRUMENT_ID:312190
[Date of access: 22 Jul. 2016].

ILO (International Labour Organisation). 2017. <http://www.ilo.org/global/about-the-ilo/lang--en/index.htm>. [Date of access 27 July 2017].

Jewkes, R., Morrell, R., Hearn, J., Lundqvist, E., Blackbeard, D., Lindegger, G., Quayle, M., Sikweyiya, Y. & Gottzén, L. 2015. Hegemonic masculinity: combining theory and practice in gender interventions. *Culture, Health & Sexuality*, 17(2):S112-S117.

Kanwar, Y.P.S., Kodwani, D.O. & Singh, A.K. 2012. A Study of Job Satisfaction, Organizational Commitment and Turnover Intent among the IT and ITES Sector Employees. *SAGE Publications*, 16(1):27–35.

Kothari, C.R. 2004. Research methodology: Methods and techniques. 2nd ed. Delhi: New Age International.

MacCallum, R.C., Widaman, K.F., Preacher, K.J. & Hong S. 2001. Sample size in factor analysis: The role of model error. *Multivariate Behavioral Research*, 36(4):611-637.

Mashiane, B.R. 2009. Transformational barriers against women's advancement in South African Platinum Mining Companies. uir.unisa.ac.za/handle/10500/3747 Date of access: 29 Sep. 2016.

McNeilly, M.D., Anderson, N.B., Armstead, C.A., Clark, R., Corbett, M., Robinson, E.L., Pieper, C.F. & Lepisto, E.M. 1996. The perceived racism scale: A multidimensional assessment of the experiences of White racism among African Americans. *Ethnicity and Disease*, 6:154-166.

Mine Health and Safety Council: <http://www.mhsc.org.za/mining-legislation> Date of access: 13 Jul. 2017.

Mlambo, Y. 2011. Women in mining: Legislation and representation for women in mining. www.consultancyafrica.com. Date of Access: 29 Sep. 2016.

Mompei, P. 2016. When gender equality remains unequal. *African Leader*, 51:28-29, October.

Ntombela, D. 2014. Women in mining: Women in mining face challenges. *Inside Mining*, 6:39.

Olckers, C. & Enslin, C. 2016. Psychological ownership in relation to workplace trust and turnover intent. *Journal of Psychology in Africa*, 26(2):119-126.

Pallant, J. 2010. SPSS Survival Manual, 4th ed. New York, NY: McGraw-Hill.

Pan African Resources PLC. Operations overview.

<http://www.panafricanresources.com/operations-overview/south-africa/>. Date of access: 14 Jul. 2017.

- Rosenberg, M. 1979. *Conceiving the self*. New York, NY: Basic Books.
- Salinas, P. 2013. Discourses as control devices in the mining culture: tensions in the integration of women in Chilean mining. *International Journal of Communication*, 7:1835-1851.
- Senkhane, M. 2015. Women - mining's untapped resource: in the spotlight. *Inside Mining*, 8(4):10.
- Senkhane, M. 2015. Women in mining faces challenges. *Inside Mining*, 6(2):28
- Simango, K.B. 2006. An investigation of the factors contributing to failure of heat tolerance screening by women at Impala Platinum. Johannesburg: The Da Vinci Institute for Technology Management.
- Sjöberg, A. & Sverke, M. 2000. The interactive effect of job involvement and organizational commitment on job turnover revisited: A note on the mediating role of turnover intention. *Scandinavian Journal of Psychology*, 41(3):247-252.
- South Africa. 1991. Minerals Act 50 of 1991.
- South Africa. 2002. Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002).
- South Africa. 2004. Broad-based Socio-economic Empowerment Charter for the South African Mining Industry. Notice No. 1639, 2004. *Government Gazette*, 26661:9–112, 13 Aug.
- South Africa. 2009. Employment Equity Act (Act No. 55 of 1998).
- South Africa. 2010a. Amendment of the Broad-based Socio-economic Empowerment Charter for the South African Mining and Minerals Industry.
<http://www.dmr.gov.za/publications/summary/108-mining-charter-downloads/128-amendedofbbseecharter.html> Date of access: 21 Jul. 2017.
- South Africa. 2010b. Revised Social and Labour Plan Guidelines.
<http://www.dmr.gov.za/guidelines-revised-social-and-labour-plans/summary/119-how-to/221-guidelines-revised-social-and-labour-plans-.html> Date of access: 21 Jul. 2017.

South Africa. 2015. Department of Mineral Resources. Assessment of the Broad-based socio-economic empowerment charter for the South African mining industry (Mining Charter), May 2015. <http://www.dmr.gov.za/publications/summary/262-mining-charter-assessment-report-2015/6710-assessment-of-the-broad-based-socio-economic-empowerment-for-the-south-african-mining-industrymining-charter-may-2015.html> . [Date of access: 21 July 2017].

South Africa. 2017a. Chamber of Mines. Women in mining Fact sheet 2017. <http://www.chamberofmines.org.za/industry-news/publications/fact-sheets/send/3-fact-sheets/424-women-in-mining> Date of access: 26 Jul. 2017.

South Africa. 2017b. The Reviewed Broad-based Black - Economic Empowerment Charter for the South African Mining and Minerals Industry, 2016. Notice No 581, 2017. *Government Gazette*, 40923: 2-18, 15 June.

South Africa. Department of Mineral Resources. 2009. Mining Charter impact assessment report. http://www.gov.za/sites/www.gov.za/files/Mining_Charter_Impact.pdf Date of access: 21 Jul. 2017.

Stats SA. 2017. Statistics South Africa. <http://cs2016.statssa.gov.za> Date of Access: 26 Jul. 2017.

South Africa. 1956. The Mines and Works Act (No 27 of 1956).

Tavakol, M. & Dennick, R. 2011. Making Sense of Cronbach's Alpha. *International Journal of Medical Education*, 2:53-55.

Welman, C., Kruger, F. & Mitchell, B. 2011. Research Methodology. 3rd ed. Cape Town: Oxford University.

Wharton, A.S. 2006. The sociology of gender: an introduction to theory and research. Oxford: Blackwell.

Wiggins, S. & Al-Obaidi, J. 2013. Introduction: Women and gender in the Middle East: recognition, reflection, and realignment. *Journal of Women's Studies*, 14(2):1-2.

Winter, C.J.F. & Gosling S.D. 2016. Comparing the Pearson and Spearman Correlation coefficients across distributions and sample sizes: a tutorial using simulations and empirical data. *American Psychological Association*, 21:273-290.

ANNEXURE 1: Extract from the Amendment of the Broad-based Socio-economic Empowerment Charter for the South African Mining and Minerals Industry.

SCORECARD FOR THE BROAD-BASED SOCIO-ECONOMIC EMPOWERMENT CHARTER FOR THE SOUTH AFRICAN MINING INDUSTRY

INDUSTRY										
ELEMENT	DESCRIPTION	MEASURE	COMPLIANCE TARGET BY 2014	PROGRESS ACHIEVED BY					Weighting	
				2010	2011	2012	2013	2014		
1	Reporting	Has the company reported the level of compliance with the Charter for the Calendar year	Documentary proof of receipt from the department	Annually	March 2011	March 2012	March 2013	March 2014	March 2015	Y/N
2	Ownership	Minimum target for effective HDSA ownership	Meaningful economic participation	26%	15%				26%	Y/N
		Full shareholder rights	26%	15%				26%		
3	Housing and living conditions	Conversion and upgrading of hostels to attain the occupancy rate of one person per room.	Percentage reduction of occupancy rate towards 2014 target.	Occupancy rate of one person per room	Base-line	25%	50%	75%	100%	Y/N
		Conversion and upgrading of hostels into family units	Percentage conversion of hostels into family units	Family units established	Base-line	25%	50%	75%	100%	
4	Procurement & Enterprise Development	Procurement spent from BEE entity	Capital goods	40%	5%	10%	20%	30%	40%	5%
			Services	70%	30%	40%	50%	60%	70%	5%
			Consumable goods	50%	10%	15%	25%	40%	50%	2%
		Multinational suppliers contribution to the social fund	Annual spend on procurement from multinational suppliers	0.5% of procurement value	0.50%	0.50%	0.50%	0.50%	0.50%	3%
5	Employment Equity	Diversification of the workplace to reflect the country's demographics to attain competitiveness.	Top Management (Board)	40%	20%	25%	30%	35%	40%	3%
			Senior Management (Exco)	40%	20%	25%	30%	35%	40%	4%
			Middle Management	40%	30%	35%	40%	40%	40%	3%
			Junior Management	40%	40%	40%	40%	40%	40%	1%
			Core Skills	40%	15%	20%	30%	35%	40%	5%
6	Human Resource Development	Development of requisite skills, incl. support for South African based research and development initiatives intended to develop solutions in exploration, mining, processing, technology efficiency (energy and water use in mining), beneficiation as well as environmental conservation and rehabilitation	HRD expenditure as percentage of total annual payroll (excl. mandatory skills development levy)	5%	3%	3.5%	4.0%	4.5%	5.0%	25%

STAATSKOERANT, 20 SEPTEMBER 2010

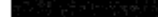
No. 33573 17

SCORECARD FOR THE BROAD-BASED SOCIO-ECONOMIC EMPOWERMENT CHARTER FOR THE SOUTH AFRICAN MINING INDUSTRY

ELEMENT	DESCRIPTION	MEASURE	COMPLIANCE TARGET BY 2014	PROGRESS ACHIEVED BY					Weighting	
				2010	2011	2012	2013	2014		
7	Mine community development	Conduct ethnographic community consultative and collaborative processes to delineate community needs analysis	Implement approved community projects	Up-to-date project implementation	Implementation of projects will serve to enhance relationships amongst stakeholders leading to communities owing patronage to projects.					15%
8	Sustainable development & growth	Improvement of the industry's environmental management	Implementation of approved EMPs.	100%	Annual progress achieved against approved EMPs.					12%
		Improvement of the industry's mine health and safety performance	Implementation of the tripartite action plan on health and safety	100%	Annual progress achieved against commitments in the tripartite action plan on health and safety.					12%
		Utilisation of South African based research facilities for analysis of samples across the mining value chain	Percentage of samples in South African facilities	100%	establish baseline	25%	50%	75%	100%	5%
9	Beneficiation	Contribution of a mining company towards beneficiation (this measure is effective from 2012)	Additional production volume contributory to local value addition beyond the base-line	Section 26 of the MPRDA (percentage above baseline)	The beneficiation strategy and its modalities of implementation outline the beneficiation requirements per commodity extracted in South Africa.					-
TOTAL SCORE										100%

Y/N applies to pillars that are ring-fenced.

Legend

	0-25% (Gross non-compliance)
	25-50% (Non-compliance)
	50-75% (Marginal to acceptable performance)
	75-100% (Excellent performance)

ANNEXURE 2: Extract from the Reviewed Broad Based Black-Economic Empowerment Charter for the South African Mining and Minerals Industry, 2016: Publication of and invitation to comment on the Draft 39933

Reproduced by Subinnet Online in terms of Government Printer's Copyright No. 10505 dated 02 February 1998

20 No. 39933 GOVERNMENT GAZETTE, 15 APRIL 2016

In this regard, the Mining Charter provides for a mechanism for companies to offset up to 11 percentage of the 26% of the ownership reserved for black people.

2.4 EMPLOYMENT EQUITY

The purpose of Employment Equity Act, 55 of 1998, (Act No. 55 of 1998) (EE Act) is to achieve equity in the workplace by promoting equal opportunity and fair treatment in employment through the elimination of unfair discrimination; and implementing affirmative action measures to redress the disadvantages in employment experienced by designated groups, in order to ensure their equitable representation in all occupational levels in the workforce.

Consistent with the EE Act, workplace diversity and equitable representation at all levels are catalysts for social cohesion, transformation and competitiveness of the mining industry. In order to create a conducive environment to ensure diversity as well as participation of black people at all decision-making positions and core occupational categories in the mining industry, every mining company must achieve a minimum threshold of black people representation as follows:

Executive Management (Board)

- (a) A minimum of 50% Black people with exercisable voting rights and proportionally representative, 15% of which must be black females in line employment active population (EAP).
- (b) A minimum of 50% Black people proportional represented at the executive directors' level as a percentage of all executive directors of which 25% must be black female in line with the employment active population.

Senior Management (EXCO)

- (a) A minimum of 60% Black Employees in Senior Management as a proportional representative percentage of all Senior Management of which 30% is black females in line with the employment active population.

Middle Management level

- (a) A minimum of 75% of Black employees in Middle Management as a proportional representative percentage of all middle Management of which 38% is black females employees in that category in line with the employment active population.

Junior Management level

- (a) A minimum of 88% Black employees in Junior Management as a proportional representative percentage of all junior management of which 44% is black females in that category in line with the employment active population (EAP).

Employees with disabilities

- (a) 2% of Black employees with disabilities as a percentage of all employees.

Core and Critical skills

Mining right holders must ensure that a minimum of 40% Black people are represented in the mining company's core and critical skills by diversifying their existing pools. To achieve this, the right holder must:

- (a) Identify and fast track their existing pools for core and critical skills.
- (b) The abovementioned fast tracking of pools must be a proportional representation of the workforce.

8th ANNUAL WOMEN IN MINING

-Moving From The Integration To The Development Of Women In Mining

Date: 22, 23 & 24 February 2017

Venue: Gallagher Estate, Midrand

CPD CREDITS
(1 PER DAY)

INTERNATIONAL PERSPECTIVE


Cynthia Carroll
Chairperson
VEDANTA RESOURCES
HOLDING


Wendy Treasure
Director of Academia and
Research
INTERNATIONAL WOMEN
IN MINING (IWIM)


Monika Ospina
Founder and Director
O TRADE
Member
INTERNATIONAL WOMEN
IN MINING (IWIM)


Dr Gargi Mishra
Founder
MINING INNOVATION
Member
INTERNATIONAL WOMEN
IN MINING (IWIM)


Duduzile Kunene
Regional Manager
WESTERN CAPE DEPARTMENT OF
MINERAL RESOURCES (DMR)


Beauty Mazibuko
Head of Business Services
ANGLO THERMAL


Sarah Luthuli
Vice-President, Corporate Affairs
and Human Capital
FOSKOR (PTY) LTD


Nosipho Nyemane
Manager: Mineralogy
MINTEK


Lebogang Ramphole
Group Enterprise Development
Practitioner
PETRA DIAMONDS


Farana Boodhram
CEO
AVITA MINING


Ahearni Rahumbutu
Mine Planning Engineer
THABISA MINERALS


Sisiwe Mtshethwa
Manager: Training & Development
PALABORA COPPER (PTY) LIMITED


Olebogeng Se ntho
Head of Operations
YEABO MINING


Nozipho Zitha
Transformation Superintendent
PALABORA MINING COMPANY


Nondumiso Nonkululeko Radebe
Social Compliance & Sustainability
LAFARGE MINING


Dr Lilita A Marques
Human Resource Development
Manager
NAMIBIA DIAMOND
CORPORATION

SKILL-DRIVEN WORKSHOPS FOCUSING ON WOMEN IN MINING


Adv Johann Raubenheimer
Risk Management Consultant
HOGAN LOVELLS


Nonhlanhla Sibanda - Moyo
Gender and Women's Rights
Specialist
CENTRE FOR THE STUDY OF VIOLENCE AND RECONCILIATION

KEY STRATEGIES TO BE DISCUSSED:

- Advancing the mining industry by investing in the research, development and training of women
- Understanding the current state of the mining industry in order to make a positive contribution
- Becoming an SME supplier by looking at current opportunities
- Empowering women in mining to lead in a man's world
- Encouraging women to report sexual violence with accuracy and in turn provide a supportive environment
- Discussing women's physical abilities and overcoming common challenges
- Evaluating your Social Labour Plans and needs analysis of the community

CONFERENCE HIGHLIGHTS

Join ITC at the end of Day 1 for a Special networking session

Register and pay by 1 February 2017 and receive a gift bag filled with great surprises

Join ITC at the end of Day 2 for an interactive image and makeover session

Feedback & recommendations will be requested by the end of the conference

CPD VALIDATED BY:

E C S A

ITC is a proud member of:

Mineral Research

MINING WEEKLY

ENGINEERING NEWS

BIZCOMMUNITY

ITC
Integrated Training Centre

ITC IS EITDP & MICT SETA ACCREDITED & A LEVEL 1 B-BBEE COMPANY

For easy registration contact Zahlele +27 (0) 11 326 2601 or email bookings@iitc.co.za or fax: +27 (0) 11 326 2600 or visit: www.iitc.co.za

Research & Developed By:

ANNEXURE 3A: LETTER OF PERMISSION TO CONDUCT SURVEY



Date: 18 February 2017

To whom it concerns

Re: Dissertation, distribution of questionnaires approval letter.

We are proud to be able to assist Mrs. Sheena Mangaroo-Pillay a student of the North West University, Student No: 23006242 with her studies.

ITC hosts the Women in Mining Conference annually with almost 150 delegates from various mining houses throughout South Africa.

Mrs. Pillay has requested that we allow her to distribute her questionnaires at our conference to our delegates, as she is conducting a dissertation on: Women's perceptions of the workplace in the mining industry in South Africa. We have agreed to help her in this regard on the condition statistics will be made available to ITC for us to give feedback to our delegates.

If there is any queries please contact Sammeera Khalek on contact details below.

Email: sammeera@intelligencetransferc.co.za

T: +27 11 326 2501

F: +27 86 508 9818

M: + 27 82 819 2759

A handwritten signature in black ink, appearing to read 'Ankie Roux', is written over a dotted line.

Approving manager: Ankie Roux

PP

Company registration number: 2007/211779/23, Vat registration number: 4140242563
Address: Petrob House, 1st Floor West, 343 Surrey Avenue, Ferndale, Randburg, 2194
Telephone number: 011 326 2501, Fax: 011 326 2960
www.intelligencetransferc.co.za
BEE-LEVEL 1 & ETDPA SETA ACCREDITATION

ANNEXURE 4: QUESTIONNAIRE:

Dear Participant

My name is Sheena Mangaroo-Pillay. I am a third year MBA (Masters in Business Administration) student at the North-West University. I am conducting research on: “Women’s perceptions of the workplace in the mining industry in South Africa”.

In this survey the purpose is to identify what is your perception (observation) of the workplace of women in the mining industry, relative to your observations, views and experiences.

Others, including your peers may have different opinions about these issues, which range from very positive towards very negative. I would like to establish what you think, as you are working in the mining industry or have worked in the mining industry.

This survey will be utilised strictly for research purposes only.

There will be no intentional danger, risks or harm brought upon you, in your participation. To complete this questionnaire, you will need approximately 10 minutes.

Your participation is on a voluntary basis only.

I thank you and truly appreciate your support and time.

Kind regards

Sheena Mangaroo-Pillay

Cell: 071 851 2440

Email: smangaroopillay@gmail.com

SECTION A:

The information below is required for meaningful data analysis.

Mark the applicable block with a cross (X). Please complete all questions.

SECTION 1: BIOGRAPHICAL INFORMATION:

Bio 1	Your age	< 20 Years	21-30 years	31-40 years	41-50 years	51- 60 years
		1	2	3	4	5

Bio 2	Gender:	Male	Female	Other	
		1	2	3	

Bio 3	Race Group:	Black	White	Coloured	Indian	Other
		1	2	3	4	5

SECTION 2: QUALIFICATIONS AND JOB EXPERIENCE

Bio 4	Highest Qualification obtained:	Matric & Below	Diploma	Degree	Honours	Masters/ Doctorate
		1	2	3	4	5

Bio 5	Level of Employment at the mine:	Unskilled worker	Semi-skilled worker	Skilled worker	Junior Management	Middle management
		1	2	3	4	5
		Senior management	Top (Executive) management			
		6	7			

Bio 6	What is your current role:	Intern/ Graduate/ Learner Official	Miner	Shift Boss/ Mine Overseer	Manager Mining	Other (Please specify)
		1	2	3	4	5

Bio 7	How many years are you working or have worked in the mining industry:	< 5 years	6-10 Years	11-20 years	21-30 years	30 > years
		1	2	3	4	5

Bio 8	How much do you currently earn working in the mining industry:	< R5 000	R5 001- R10 000	R10 001- R20 000	R20 000 - R40 000	R40 000 >
		1	2	3	4	5

Bio 9	Where is/was your place of work in the mining industry:	Underground	Surface	Underground & Surface	Other
		1	2	3	4

Bio 10	In which Province do/ did you work when in the mining industry	North West Province	Western Cape	Northern Cape	Eastern Cape
		1	2	3	4
		KwaZulu Natal	Gauteng	Limpopo Province	Mpumalanga
		5	6	7	8
		Free State			
		9			

Bio 11	In which mining sector do you work	Gold	Platinum	Coal	Uranium
		1	2	3	4
		Copper	Other: Please specify		
		5	6		

Bio 12	Are you working in an open pit or deep mining/ underground mine	Open Pit	Deep mining/ underground mine
		1	2

Bio 13	Are you affiliated to a union:	Yes	No
		1	2

SECTION 3: PERCEPTIONS OF THE WORKPLACE OF WOMEN IN THE MINING INDUSTRY

In this section please mark an X, once only for the statements made. These statements are related to you working in a mining company or having worked in one.

No.	Statement	1 Strongly Disagree	2 Disagree	3 Agree	4 Strongly Agree	5 Neutral
1.	Transformation is at the top of this organisation's agenda.					
2.	Management reminds employees about the importance of women in the organisation.					
3.	Management encourages employees to embrace diversity.					
4.	I feel that females' inputs are valued in the organisation.					

5.	The facilities at the organisation are conducive for women to work in.					
6.	Men in the workplace think women are weak.					
7.	Women get promoted more easily than men are.					
8.	Women in management need to work extra hard to prove themselves.					
9.	There are good relations between female and male miners.					
10.	There are good relations between female and male management.					
11.	Male managers dominate the work environment.					
12.	The female miners' uniforms are comfortable for them to work in.					
13.	Personal protective equipment and clothing have been designed especially for women.					
14.	The toilets at the workplace are suitable for females on surface.					
15.	The toilets at the workplace are suitable for females underground.					
16.	It is easy for women to communicate with men in the workplace.					
17.	Male workers harass females.					
18.	I am a victim of sexual and/or physical harassment.					
19.	Male workers emotionally abuse me at times.					
20.	Male managers understand that I am also a mum with responsibilities.					
21.	Taking child responsibility leave is a problem.					
22.	Pregnant women are moved to non-hazardous working environments					
23.	The organisation has made changes to accommodate women.					
24.	My manager supports women's development in their careers.					
25.	My manager is keen to approve studies for females.					
26.	The organisation offers training programmes for females.					
27.	There are more men than women on training programmes.					
28.	Programmes are in place to address gender inequalities.					
29.	Management involves women in decision making.					

30.	I have a career development plan in place.					
31.	I am on a mentorship programme.					
32.	Unions have made a difference in the improvement in the workplace for women.					
33.	I am forced to work at the mines as the income is good.					
34.	Given the chance, I will not work at a mine.					
35.	I believe that there is a place for women in the mining industry.					

Thank you.



Private Bag X6001, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Web: <http://www.nwu.ac.za>

Statistical Consultation Services

Tel: +27 18 285 2447
Fax: +27 0 87 231 5294
Email: monique.vandeverster@nwu.ac.za

26 September 2017

Re: Dissertation, Ms S Mangaroo-Pillay, student number 23006242

We hereby confirm that the Statistical Consultation Services of the North-West University analysed the data involved in the study of the above-mentioned student and assisted with the interpretation of the results. However, any opinion, findings or recommendations contained in this document are those of the author, and the Statistical Consultation Services of the NWU (Potchefstroom Campus) do not accept responsibility for the statistical correctness of the data reported.

Kind regards

Prof SM Ellis (P.r. Sci. Nat)

Associate Professor: Statistical Consultation Services

ANNEXURE 6: DECLARATION OF LANGUAGE EDITING

DECLARATION OF LANGUAGE EDITING

The mini-dissertation submitted in partial fulfilment of the requirements for the degree MBA at Potchefstroom Campus of the North-West University entitled

'The perceptions of women in the workplace in the South African Mining Industry'

By S. Mangaroo-Pillay, Student No: 23006242

has undergone a language-edit by

Dr Barbara Basel

D.Litt. University of Pretoria, MA Potchefstroom University, BA UNISA

Executive Member of English Academy of Southern Africa

Lecturer in English Literature and Linguistics at Pearson Institute of Higher Education, Cape Town Campus.

Academic Editing – MBA Theses, MPM Theses, MEd Theses, Masters in Graphic Design Thesis.
External Examiner for MEd Thesis.

1 Six Oaks,
5, Adelaide Road
Plumstead, Cape Town 7800
Tel :021 761 4289; Cell: 082 6511659
barbara.basel@gmail.com



11 October 2017

ANNEXURE 7: LETTER OF TECHNICAL AND TYPOGRAPHICAL EDITING



Dynamic Language &
Translation Specialists

Antoinette Bisschoff
71 Esselen Street, Potchefstroom
Tel: 018 293 3046
Cell: 082 878 5183
antoINETTEbISSchoff@mweb.co.za
CC No: 1995/017794/23

Monday, 23 October 2017

To whom it may concern,

Re: Letter of confirmation of technical and typographical editing

The dissertation "The perceptions of women in the workplace in the South African Mining Industry" by S. Mangaroo-Pillay (23006242) has been edited technically and typographically. The referencing and sources were checked as per NWU referencing guidelines.

Antoinette Bisschoff

Officially approved language editor of the NWU since 1998
Member of SA Translators Institute (no. 100181)

Precision ... to the last letter