

A PRO-ACTIVE APPROACH TO CURB ASSET THEFT AT A SOUTH AFRICAN MINE

by

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ABSTRACT

The South African mining industry has not been shielded from the criminal threat the country faces. In this case study, the nature and extent of asset theft at one of the largest mining companies in South Africa is analysed. The crime prevention strategy adopted by the mine to curb asset theft was studied over a period of five years. This involved a survey of the views of the security managers on the effectiveness of the strategy implemented by the mine. Against the background of the South African Government's broad description of the crime prevention approach adopted by the country, the researcher explored whether it would be practicable to implement an integrated crime prevention strategy – encompassing situational, social and law enforcement crime prevention approaches on primary, secondary and tertiary level – at the participating mine in order to curb asset theft.

Key terms: South African mine; Asset theft; Situational crime prevention; Crime prevention through environmental design; Crime reduction through product design; Social crime prevention; Crime prevention through law enforcement; Community policing; Crime displacement; Crime diffusion

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GLOSSARY OF TERMS

Asset category:

"Copper-related assets": All copper and copper cable belonging to the participating mine.

"Property-related assets": All property belonging to the participating mine, including movable items such as tools, equipment, personal belongings of personnel and vehicles. It excludes the prime product of the mine and any copper or cable thefts, which are recorded separately.

Employment category:

"Contractor": Personnel of vendors (contracting companies) or suppliers. "Contracting" employees are subjected to the same procedures and governance as "permanent employees".

"Mine": Personnel employed permanently by the participating mine.

"Non-mine": Offenders that are employed elsewhere but are trespassing on the mine premises.

"Security": Personnel performing asset protection duties either full time as permanent staff or through external security contracts.

"Unemployed": Offenders that are not employed and are trespassing on the mine premises.

Result category:

"Guilty": Referring to any offender found guilty of the crime in either a departmental disciplinary hearing or a criminal court hearing or both.

"Not guilty": Referring to any offender found not guilty of the crime in either a departmental disciplinary hearing or a criminal court hearing or both.

"Recovery only": Cases where the perpetrators of the crime have not been identified, but a full recovery was made either physically or the employee found to be negligent in securing the mine asset refunded the mine for the losses.

"Undetected": Cases where the offenders of the crime have not been identified, or suspects fled but no warrant has been issued for their arrest.

"Warrant of arrest": Cases where the offenders have been identified but failed to appear in court and a warrant for arrest has been issued.

"Withdrawn": Cases that were closed when no further action was taken by the mine or the court has declined to prosecute as the evidence was not sufficient to go to trial.

Value category:

"Insurance claims": Included in the category "value involved" but also specified separately in order to monitor the claims. **"Production losses":** Value in ZAR of financial losses as a result of production downtime caused by crime.

"Total loss to mine": Value in ZAR of financial losses as a result of any crime, including the value of assets not recovered physically or through insurance claims, the excess fee of insurance claims, and production downtime losses. The participating mine records other secondary losses such as additional overtime and replacement labour costs separately, but this is not mandatory and such losses were therefore not included in this report as it would only partially reflect said losses.

"Value involved": Value in ZAR of the assets involved, excluding any secondary values associated with the crime, such as additional overtime paid, production losses, damage to fences or buildings and replacement labour costs.

"Value recovered": Value in ZAR of the assets involved that were recovered physically by security personnel and the SAPS or through insurance claims.

Student number: 30766257

I declare that **A PRO-ACTIVE APPROACH TO CURB ASSET THEFT AT A SOUTH AFRICAN MINE** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.



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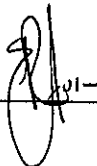
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Chapter 1

Introduction and research methodology

1.1 INTRODUCTION

"South Africa is blessed with a special geological heritage. As such, the mining industry has been the bedrock of the South African economy for more than a century." (President Nelson Mandela, 104th Annual General Meeting of the Chamber of Mines of South Africa, 8 November 1994)

Despite the implementation of a wide range of security measures, the South African mining industry has not been shielded from the criminal threat the country faces. Asset protection remains a challenge and continues to be a major concern for the industry (Chamber of Mines 2006:60-61).

Thousands of households are dependent on the continued financial success of the mining industry, one of the largest employers in South Africa. By virtue of the place the mining industry occupies in the South African economy, it can make a special contribution to the transformation of society and in the process improve the quality of life of numerous South African citizens. The loss of assets and product as a result of theft has a direct negative impact on the mine's profit margin and financial sustainability (Coetzee & Horn 2007:91). The criminal threat to the mining industry "is thus becoming a threat to South Africa's national growth and economic future" (ibid:105).

1.1.1 The research problem

Crime in South Africa has been a topic of concern for the government since 1994. In an effort to address crime, the government and various private sector security divisions started to adopt a proactive approach focusing on crime prevention more holistically. The National Crime Prevention Strategy (NCPS) launched by the South African Government in May 1996 billed a holistic national strategy for reducing crime in South Africa. The strategy emerged from the deliberations and research of a multi-disciplinary team of experts from the state and civil society tasked with establishing a long-term strategy to focus the state's attention on addressing the root causes of crime in the country. This was premised on the understanding that to effectively reduce crime, a proactive

approach that included but went beyond the criminal justice system was required (South African Government 1998b:9-12).

The Minister of Safety and Security highlighted the importance of a multi-agency approach to crime prevention in the White Paper on Safety and Security 1999-2004 and stated that "those, other than the police, who have been involved in crime prevention have also been challenged in ensuring a wider recognition of the fact that crime is more than a security issue" (South African Government 1998b:4).

The United Nations Guidelines for the prevention of crime as defined at the 11th Session of the United Nations in Geneva in 2002 stated that "crime prevention" comprises an extensive range of approaches. When clarifying the objectives, countries should aim to achieve the following with their respective crime prevention strategies:

- To promote the welfare of individuals and encourage pro-social behaviour through social, economic, health and educational measures, with a particular focus on the risk and protective factors associated with crime and victimisation (prevention through social development – also known as social crime prevention models);
- To change the conditions in residential areas that contribute towards offending, victimisation and the insecurity that results from crime by building on the initiatives, expertise, and commitment of community members (locally based, also known as community-based crime prevention models);
- To aim at preventing the occurrence of crimes by reducing the opportunities, increasing the risks of being apprehended and minimising the benefits, including situational crime prevention models and crime prevention through environmental design models; and
- To prevent recidivism by assisting in the social reintegration and rehabilitation of offenders and by providing assistance and information to potential and actual victims (reintegration programmes).

Reflecting worldwide trends, the private security domain in South Africa has experienced rapid growth in the last decade. That growth combined with changing policing styles in South Africa led to increased demands for greater involvement from the private sector in policing and crime prevention activities (Minnaar 2004:1).

The Institute for Security Studies (ISS) examined the occurrence and trends of theft of precious metals in the South African mining industry over a period of five years, namely January 2000 to December 2004. It was found that considerable differences between the physical location of mines and other external influencing factors have led to various

methodologies being adopted by the different mining houses in South Africa concerning the best method of asset protection for the industry. These diverse proactive approaches led to substantial variations in the allocation of human resources involved in the physical protection of assets, as well as in the technology used to supplement the active security methods. It was found that most South African mines implement state-of-the-art security measures in an effort to protect their assets against theft. Physical security measures are however continuously tested by offenders and therefore need to be constantly evaluated and improved (Coetzee & Horn 2007:97-100).

1.1.2 Purpose statement

One of the largest mining companies in South Africa agreed to take part in a research study aimed at examining the extent of asset theft at a particular mine and to survey the perceptions and experiences of the participating mine's security managers on the effectiveness of the crime prevention strategy applied at the mine with the objective of providing information the participating mine can use for their crime prevention strategy to address asset theft.

Preliminary interviews were conducted with the head of security at the participating mine during 2007 to determine the proactive approach the mine applies in general to address crime and to establish which preventative strategy was implemented to prevent theft of mine assets in particular.

It was established that the security measures implemented by the participating mine on the mining sites were aimed at protecting all mine assets, property, products and personnel. It was also the responsibility of the security division to manage access of permanently employed personnel (employees) and personnel of sub-contracting companies (contractors) to the mine. In general, theft prevention strategies implemented at the participating mine were predominantly based on the principles of situational crime prevention methods at the time.

Situational crime prevention (SCP) is a specific target-oriented approach to crime prevention utilising managerial techniques, design and manipulation of the environment to reduce the criminal risks by making it more risky and less rewarding (Bajpai 2004:10).

The purpose of this research was to explore, by conducting a case study, alternative crime prevention approaches that can be used to supplement the preventative strategy adopted by the participating mine to address asset theft.

The case study as a research strategy can be defined as an empirical inquiry that investigates a contemporary phenomenon within its real-life context and explores the boundaries between the phenomenon and its context during which multiple sources of evidence (including quantitative findings) are used to contribute to greater understanding (Yin 1984:14).

1.1.2.1 Objectives of the study

The case study was conducted at a particular mining company based in South Africa (who requested to remain anonymous) over a period of five years, namely 2006 to 2010.

The aim of the case study was not to generalise findings as representative of the mining industry in South Africa, although it is plausible that other mining companies in South Africa may experience similar problems with asset theft and could apply a similar proactive approach.

The focus of the case study included the following:

- To establish the extent of asset theft at the participating mine during the period January 2006 to December 2010, focusing on:
 - Number of incidents
 - Type of assets at risk
 - Modus operandi used by perpetrators
 - Financial losses involved
 - Type of perpetrators (employees, contractors or non-mine employees)
 - Results of incidents (criminal cases)
- To examine the best practices at the participating mine on the crime prevention strategy implemented in terms of effectiveness and efficiency
- To review literature in crime prevention for similar contexts and
- To make recommendations on the most viable preventative strategy for the participating mine

The research question can be stated as:

“Which crime prevention approaches to curb asset theft are practicable at the participating mine?”

1.1.3 Key theoretical concepts

The terms defined below are to be used for the purpose of this case study.

1.1.3.1 Crime prevention (proactive approach)

“Crime reduction” and “crime prevention” are essentially the same things, namely combinations of actions designed to eliminate and/or minimise the occurrence of crime and the harm associated with it (Andersen & Brown 2005:2).

The South African Government provided a broad new description of crime prevention encompassing all activities which can reduce, deter or prevent the incidence of crime. For the purpose of this case study “crime prevention” (the proactive approach) will be considered to include all three focus areas of crime reduction defined by the South African Government, namely altering the environment in which crime occurs; changing the conditions which are considered to cause crime; and providing a strong deterrent against crime with an effective criminal justice system (South African Government 1998b:20).

1.1.3.2 Theft

For the purpose of this case study, “theft” will be considered in the context of South African Criminal Law and defined as the unlawful and intentional removal of movable property belonging to another (Snyman 1986:511).

1.1.3.3 Mine property (assets)

An asset is defined as a present economic resource to which an entity has a present right or other privileged access (International Accounting Standards Board 2006:4).

For the purpose of this case study, “mine property” (assets) of the participating mine will denote any movable economic resource owned by the mine from which any present or future economic benefits may be obtained.

1.1.4 Value of the research

According to the Chamber of Mines (2006:11) mining companies are being constrained from investing in new mining projects in South Africa owing to the increasing uncertainty over legal titles and mining prospecting rights. The Chamber estimated that about R10 billion of fixed investment in South Africa’s mining sector is being forfeited annually as a result of these constraints. Many large mining companies face having to retrench

thousands of employees as the boundaries of their existing mining rights are reached and new prospecting rights have not yet been issued.

In addition, the activities of illegal miners and the theft of precious metals continue to pose a risk to the sustainability of the South African mining industry. Not only is there a direct financial loss to the mining company concerned, but there are also knock-on financial losses to employees and the government (such as reduced employment and taxes). In the light of the difficulties the South African mining industry faces, further losses as a result of crime – theft in particular – raise serious concerns (Chamber of Mines 2010:125).

The participating mine has not been shielded from the global financial difficulties or the impact of crime the South African mining industry face and according to the head of security, asset theft in particular remains a big challenge. This case study contributes to a better understanding of the crime prevention strategy needed to address asset theft at the participating mine.

Other mining companies and organisations, like the Chamber of Mines, may also benefit from the case study by acquiring a better understanding of the phenomena and considering the findings and recommendations when formulating crime prevention strategies to address asset theft in the South African mining industry.

1.2 RESEARCH DESIGN

Creswell (2009:3-5) describes three types of research design, namely qualitative (a means for exploring and understanding the meaning in a social context), quantitative (a means for testing of theories objectively by examining the relationship among measurable variables) and mixed methods (a combination of these two approaches). Research designs are procedures for research that span the decisions from broad assumptions to detailed methods of data interpretation. Research design can be regarded as the proposal to conduct research and involves the intersection of philosophy, strategies of inquiry, and the specific methods used (ibid:5).

According to Creswell (2009:3) informing the decision which research design to use for the study of a specific topic should be the worldview (philosophical) assumptions the researcher brings to the study; the research approach (procedures of inquiry or strategies); and the research method (data collection, analysis and interpretation).

1.2.1 Philosophical worldview

A paradigm or worldview can be defined as the basic set of beliefs that guides the actions of people (Guba 1990:17-18). Many paradigms guide the actions of people: the adversarial paradigm guides the legal system; the judgmental paradigm guides winners in sporting events; religious paradigms guide spiritual and moral life, and so forth. In research, however, the focus is on those paradigms that guide disciplined inquiry. The answers given to three basic questions characterise the basic belief systems or paradigms that may be adopted. These questions are:

- *Ontological*: What is the nature of the “knowable” or “reality”?
- *Epistemological*: What is the nature of the relationship between the knower (inquirer) and the known?
- *Methodological*: How should the inquirer go about finding knowledge?

A worldview is a general orientation about the world and the nature of research that a researcher embraces (Creswell 2009:6-11). There are four main worldviews:

- *Postpositivism* is more suitable for quantitative research. It is sometimes called the scientific method or empirical science, and believes that absolute truth can never be found.
- *Constructivism* is more suitable for qualitative research and is often combined with interpretivism in order to understand the subjective meanings, historical, cultural and social perspectives of the participants.
- The *advocacy/participatory worldview* is typically associated with qualitative research, but can form the foundation for quantitative research. Here, the focus of the research inquiry is generally intertwined with a political agenda.
- The fourth worldview is that of *pragmatism*. It mostly applies to mixed methods and techniques are chosen that best meet the needs. Truth is what works at the time and multiple methods, different worldviews, assumptions and a variety of forms of data collection and analysis are used to provide the best understanding of a research problem.

Postpositivists hold a deterministic philosophy to identify and assess the causes that influence the outcomes and is also reductionistic in that ideas are reduced to a small, discrete set of variables to test, thus developing numeric measures of observations and data sets. There are laws or theories that govern the world which needs to be tested or verified and refined in order to understand the world and phenomena found in the data (Creswell 2009:7).

The essence of the postpositivism paradigm is the belief that although a real world driven by real natural cases exists, it is not possible for humans to accurately perceive it with their imperfect sensory and intellectual mechanisms (Guba 1990:20-23). Therefore inquirers need to be critical about their research precisely because of those human frailties. However, although one can never be certain that the ultimate truth has been uncovered, there is no doubt that reality is "out there". Methodologically, in the interests of conforming to the commitment of critical realism and modified subjectivity, postpositivists place emphasis on critical multiplism, which can be regarded as a form of elaborated triangulation of information.

Postpositivists recognise that many imbalances have been allowed to emerge in the pursuit for achieving realistic, objective inquiry. A major part of the postpositivist agenda has been devoted to identifying and redressing these imbalances. The imbalance between precision and richness is considered critical to a science that defines its major goal to be prediction and control. It is therefore recognised that the zeal for precision lead to an overemphasis on quantitative research and mathematical and statistical methods. In order to redress this imbalance, more qualitative methods of inquiry have been adopted (Guba 1990:20-23).

Even though postpositivists may engage in qualitative research, the term qualitative is only a "methods-level term" and not a "paradigm-level term" as "the call for qualitative methods is by itself not a call for a paradigm shift" (Guba 1990:22).

1.2.1.1 The researcher's role

Although philosophical ideas remain largely hidden in research studies, they still influence the practice of research and therefore need to be identified and explained (Creswell 2009:5).

The researcher has been involved in crime information management for the past eighteen years, conducting mostly quantitative research and statistical analysis to identify patterns in crime trends, which embraced the researcher's postpositivist worldview. True to the beliefs of postpositivism pertaining to the imbalance of inquiry, in the researcher's quest to comprehend the crime phenomena holistically, qualitative methods were also explored towards acquiring greater understanding.

As part of this journey, the researcher was engaged in sessions as a therapist during which she interviewed victims and their families traumatised by crime. In addition to learning more about the victims of crime, the researcher became involved in crime investigations as an offender profiler. She interviewed suspects of crimes that included

child abuse, rape, robbery, murder, urban terrorism and organised crime syndicate activities. The exposure of the researcher as therapist and profiler gave her the opportunity to conduct various qualitative research studies to understand the role of the criminal justice system and the effect thereof on crime offenders as well as victims of crimes.

The researcher's continuous need to be reductionistic and develop numeric measures of observations and data sets to give meaning to it, enriched with an appreciation of the value added by a more in-depth understanding of the research topic, has led to the researcher's preference to adopt a mixed methods research approach.

The researcher found that a combination of qualitative and quantitative research approaches used when examining the relationship and patterns in data sets objectively, whilst exploring the perspectives and meanings of individuals or groups inductively, contributed to a better understanding of how to deter criminal behaviour. This approach led to her interest in the crime prevention research field.

For the past five years the researcher has been employed in the South African mining industry as a crime analyst. Her core function is analysing criminal trends to aid in the prevention of crime and the management of security threats. This understanding and knowledge of the research topic could however shape the way the researcher viewed and interpreted the findings.

The researcher commenced this study in the belief that crime will always exist and that crime prevention is merely the strategic management of an ongoing challenge to reduce the risk of loss by increasing the likelihood to be caught and by decreasing conditions that contribute to crime.

The researcher holds the opinion that despite social and cultural factors that could play a role in the occurrence of theft-related crimes, the criminal still chooses to commit theft and that these decisions result in deliberate actions based on the analysis of the circumstances or opportunities in which the theft is contemplated.

It is therefore the researcher's belief that crime prevention is a continuous chess game of strategy against opportunity and determinism.

1.2.2 Research approach

Strategies of enquiry are types of qualitative, quantitative and mixed method designs that provide specific direction for procedures – also called approaches or methodologies –

in the research design (Creswell 2009:11-13). The three approaches are not entirely separate entities, however, qualitative and quantitative approaches should not be seen as polar opposites; instead, they rather represent ends on a continuum. Mixed methods research, on the other hand, is located in the middle of the continuum because it incorporates elements of both approaches (ibid:3).

Mixed methods research can be defined as “an approach to inquiry that combines or associates both qualitative and quantitative forms” as it involves the mixing of the qualitative and quantitative approaches and philosophical assumptions in a research study. Thus it is more than simply collecting and analysing the two kinds of research data; it also involves the use of these approaches in tandem so that the strength of the study is greater than either qualitative or quantitative research (ibid:4).

Mixed methods research includes sequential (elaborating or expanding on the findings of one method with another method), concurrent (merging quantitative and qualitative data in order to provide a comprehensive analysis of the research problem) or transformative (using a theoretical lens that provides a framework for topics and methods of collecting data that involves a sequential or a concurrent approach) strategies of inquiry (ibid:14-15).

The concurrent embedded mixed methods research approach was chosen for this particular research study. It incorporates both the qualitative and quantitative strategies of inquiry, with the latter being the dominant strategy.

Quantitative strategies include survey research which provides a numeric description of trends by studying a sample of a population. Survey research includes cross-sectional studies using structured questionnaires for data collection with the intent of generalising from the sample to a specific population (Babbie 2007:253). In this research study, the asset theft incidences recorded by the participating mine over a period of five years are analysed to identify trends and offender profiles.

Many choices characterise the field of qualitative research, which can be described as a moment of discovery and rediscovery as new ways of looking, interpreting, arguing, and writing are debated and discussed (Denzin & Lincoln 2000:18). Qualitative research is a field of inquiry which crosscuts disciplines, fields and subject matters (ibid:2).

Qualitative strategies include case studies in which a process or activity is explored in depth. The conceptual structure of case studies focuses on seeking a greater understanding of the case, appreciating the uniqueness and complexity of its embeddedness and interaction with its contexts, to identify the “issues” (Stake 1995:16).

The focus of qualitative research is also on perceptions and experiences of participants (Miller 1992:195). In this case study, the proactive approaches used by a specific mine in South Africa and the perceptions of the security managers on the effectiveness of the proactive approaches used are examined.

This particular mining company was selected for the case study because it is one of largest mining companies in South Africa. The mining sites of the participating mining company are situated mainly in the Northern and North West provinces of South Africa.

1.2.2.1 Concurrent embedded mixed methods

Several typologies exist for the classification and identification of the types of strategies to be used in a mixed methods research study. The four most important aspects that influence the design of procedures for a mixed methods research study are timing, weighting, mixing and theorising (Creswell 2009:206-210).

Qualitative and quantitative data collection can either happen in phases (sequential) or at the same time (concurrent). When data are collected concurrently, quantitative and qualitative data are gathered at the same time and implementation is generally simultaneous. In this case study the information was gathered and analysed within the same timeframe.

Weighting in a mixed methods study refers to the priority given to qualitative and quantitative data in a particular research study. The weight can either be equal or it may emphasise one or the other. A preference for one type is determined by the objective of the research and depends on the interests of the researcher. In this case study, the views of the security managers were explored to obtain a better understanding of the preventive strategy applied at the participating mine as well as the other crime prevention approaches that can be considered to address the research question. In order to make recommendations on formulating proactive strategies to address asset theft at the participating mine, a deeper understanding of the crime phenomenon at the participating mine was essential. Quantitative analysis of the asset theft incidents were therefore an integral focus of the research approach used.

The different types of data can be mixed at several stages: in the data collection, data analysis, or interpretation stage, or during more than one phase. In this case study, quantitative and qualitative data were mixed during the interpretation phase in order to better understand the crime phenomenon and preventive strategy of the participating mine.

Mixing also involves the way in which the different types of data are merged on one end of the continuum, kept separate at the other end of the continuum, or combined in some way between the two extremes. When a researcher uses secondary data in a supporting role in a study, the secondary form of data is embedded within a larger and different form of data which then serves as the primary database (Creswell 2009:208). In this case study, the smaller data sample, namely the views of the security managers employed at the time of the study at the participating mine, was embedded within the larger sample of data, namely the asset theft incidents recorded by the participating mine over a period of five years.

Theorising or transforming perspectives is a final factor to consider when using a mixed methods approach. All researchers bring theories, frameworks and hunches to their research inquiries and these theories may be made explicit, may remain implicit, or may not be mentioned. An explicit theoretical perspective was used for this case study and the researcher's role (paragraph 1.2.1.1) describes the background and views of the researcher that may have influenced the research and explicates the primary method applied.

1.2.3 Research methods

The third major element in the framework is the specific research methods to be used, which involves the forms of data collection, analysis and interpretation (Creswell 2009:15).

In this case study, a combination of qualitative and quantitative techniques were used to examine the incidents of asset theft, to establish the crime prevention strategy implemented, to explore the perceptions of the effectiveness of the crime prevention strategy utilised by the participating mine, and to review the literature on other crime prevention approaches that can be integrated to test the research question.

1.2.3.1 Data collection

The aspects of a research sample that requires description includes mainly identification of the population and the selection process; a discussion of the procedures used for the selection of the sample from the available population; and a description of the sample size and how the size was computed (Creswell 2009:148).

(a) Qualitative approach

The qualitative approach to the case study included interviews with the head of the security division of the participating mine to ascertain the existing crime prevention strategy, as well as an open-ended interview questionnaire survey to explore the experiences of mine security managers regarding the effectiveness of existing security measures to prevent theft at the participating mine (see Annexure A).

During preliminary interviews at the participating mine to identify the research population, it was established that one security department was responsible for preventing and reducing security threats (including crime) in order to ensure a safe and secure business at the participating mine. For the purpose of this case study, the security department of the participating mine represented the population (individuals of interest). More than a thousand employees worked in this department, including asset protection officers, surveillance operators, investigators, forensic auditors, analysts, and a security management division.

A sample is a set of individuals selected from a population intended to represent the population in a research study (Gravetter & Wallnau 2008:4). During the preliminary interviews to identify the sample, it was established that all crime incidents and security risks detected by any member of the security department were reported to the security management division of the participating mine. It was further established that it was the responsibility of the security management division to conduct risk assessments and to implement security measures to manage the identified risks and to manage the crime prevention strategy of the participating mine. This division comprised a group manager (the head of the security division), three divisional security managers, and eleven site security managers.

The idea behind qualitative research is to purposefully select participants that will best contribute to the researcher's understanding of the research problem (Creswell 2009:178). To enable the researcher to evaluate the crime prevention strategy used by the participating mine effectively, the participants selected for the study had to be familiar with the security risks, the measures implemented to address these risks, the extent and nature of the crime incidents, and the overall crime prevention strategy adopted by the participating mine. The participants further had to be in a position to provide insight on the effectiveness of the crime prevention strategies based on their experience and role in the mine.

A non-probability sampling technique, purposive sampling, was used to identify the participants for the interview survey. Purposive sampling is a technique applied to deliberately obtain the units of analysis regarded as being representative of a relevant population (Welman & Kruger 2001:63). In this sampling method the units to be observed are selected based on the researcher's judgement about who will be most representative of the population (Babbie 2007:193).

As each member of the security management division is responsible for a different business unit and the members therefore collectively represent all the different functional areas of the security department, it was decided to use saturated sampling and to include all the members of the security management division in the sample. Accordingly, fifteen participants were included in the sample for the open-ended interview questionnaire survey. Permission was obtained from the participating mine to interview all the selected participants.

(b) Quantitative approach

The quantitative approach to the research consisted of a survey using a closed-ended incident questionnaire to establish the extent of asset theft at the participating mine (see Annexure B).

In order to identify the population for the closed-ended incident questionnaire, preliminary interviews were held with the head of security of the participating mine. It was determined that the mine comprised various corporate offices, overseas operations and mining sites. Eleven mining sites – seven mining operations, two smelters and two refineries – were situated in South Africa. All crime-related and security-related incidents that occurred at the eleven mining sites were recorded by the mine's security department. The security manager of each mining site was responsible for the accuracy of the incidents reported and verified the correctness of each electronically recorded incident before the incident report was stored in an electronic database.

For the purpose of this case study, all asset theft-related incidents recorded by the security department of the participating mine during the period of the study at the eleven mining sites in South Africa represented the population (incidents of interest). Owing to the sensitivity of prime product-related thefts, the participating mine agreed to make all the required information available to the researcher for every other asset theft-related incident recorded at each of the eleven South African mining sites during the period 1 January 2006 to 31 December 2010, excluding incidents relating to the mine's prime mining product.

During preliminary interviews to identify the sample, it was established that the different phases of the mining process result in the prime mining product having different risk levels, which are managed with different risk strategies. Since the prime mining product has a low precious metal gram per tonne concentration during some phases of the mining process, such mining sites are less likely to fall victim to product theft as the perpetrators would have to steal tonnes of ore to extract only a few grams of product. As the product is refined through the different mining phases, the precious metal gram per tonne concentration increases and therefore the likelihood of product theft increases. Consequently budget and resources allocated for the risk strategy increase as well. Not all geographical areas in which the mining sites are situated are equally exposed to product crime and therefore not all the sites have the same budget and resources available to use for their risk strategies. In the event of asset theft, however, such a distinction is not made by perpetrators. A laptop stolen from a refinery (the highest classified product theft risk site) has the same monetary value as a laptop stolen from a mining operation (lowest classified product theft risk site).

Probability sampling methods are based on the probability theory, a mathematical concept based on accepted statistical principles that refers to the ability to predict the statistical likelihood that a random event will occur. Therefore every element has a change of being chosen (Rubin & Babbie 2007:144-145). In order to understand the nature of asset theft at the participating mine (excluding the prime product), the objective of the study was to discover the other type of asset at risk and, in particular, to establish the extent of the values involved and losses that occurred as a result of asset thefts recorded at the participating mine over the period of the study.

As result of the limited research available on asset theft at South African mines in the last decade and the rare opportunity to examine the extent of asset thefts recorded at eleven mining sites situated in South Africa, although uncommon in quantitative research, it was decided to use saturated sampling for the purpose of this case study. All asset theft-related incidents (excluding the incidents related to the prime product of the participating mine) recorded at each of the eleven South African mining sites of the participating mine during the period 1 January 2006 to 31 December 2010 were therefore included in the sample. In this period, 6,045 incidences of asset theft were recorded and 6,045 incident questionnaires completed.

(c) Literature review

A literature review of the crime prevention approaches, crime risk reduction models and crime management strategies available on the research topic was done for the study. The following crime prevention models were discussed in relation to the research question:

- Situational crime prevention
- Crime prevention through environmental design
- Social crime prevention
- Crime prevention through effective law enforcement
- Community-based crime prevention

Crime prevention is an extensive research field and it should therefore be pointed out that this case study is not intended to serve as an all-inclusive review of all the crime prevention strategies, approaches and models available.

1.2.3.2 Data analysis

Data are measurements or observations, a data set is a collection of measurements or observations, and a datum is a single measurement or observation commonly called a score (Gravetter & Wallnau 2008:5).

In qualitative research, the researcher is the primary instrument in data collection. The data that emerge are descriptive and primarily consist of the participants' reported words (Miller 1992:195). Idiographic interpretation is then utilised, in other words attention is given to the particulars and the data are interpreted with reference to the particulars of the case rather than generalisations.

Qualitative research assumes that there are multiple realities and that the world is not an objective "thing" out there, but a function of personal interaction and perceptions (Merriam 1998:17). The world is regarded as a highly subjective phenomenon which needs interpreting rather than measuring. Data analysis involves collecting open-ended data based on asking general questions and developing an analysis from the information supplied by the participants (Creswell 2009:184).

(a) Open-ended interview survey

The open-ended interview survey of the case study was focused on exploring the experiences of security managers on crime prevention strategies implemented to address asset theft at the participating mine. The questionnaire was structured such as to

integrate the participants' personal experience and knowledge into the case study (see Annexure A). The interview questionnaire was circulated to all the participants to complete and follow-up interviews were conducted to clarify the answers provided. In addition to the interview questionnaire, further interviews were held during the period of the study with the participants and site visits were conducted at the participating mine to enrich the interpretation of the data. Owing to the sensitive nature of the security policy of the participating mine pertaining to audio and visual recordings, the researcher made use of field notes to record the interviews with the participants and the researcher's observations during site visits.

Qualitative data analysis is the process of systematically searching, reducing and arranging of information including interview transcripts, field notes, and other materials that were accumulated to increase the researcher's understanding of the data and to enable him or her to present what was discovered to others (Bogdan & Biklen 1992:40-44).

A central approach to data reduction and data display is the process of coding (O'Flaherty & Whalley 2004:2). Miles and Huberman (1994:57-58) described coding as labelling or assigning units of meaning to the descriptive or inferential information compiled during a study. The different type of codes includes descriptive codes, which involves little interpretation, interpretative codes, representing motive, and pattern codes representing recurrent patterns found in the data.

Tesch (1990:142-145) described the analysis process of qualitative data in eight steps with guidelines on how to complete the coding of the information. These eight steps involve a systematic process of analysing textual data. According to Creswell (2009:185-190) variations in this process exist and the qualitative data analysis technique can be described in six steps. These six steps have been used to analyse the open-ended interview questionnaire survey responses of this study and comprise the following:

- Organise and prepare the data for analysis (transcribe interviews and type up field notes).
- Read through the data (obtain a general sense of the information to reflect on its overall meaning).
- Code the information (organising the data into segments of text before bringing meaning to the information).
- Use the coding process to classify the information into themes for analysis (these themes are considered the major findings and are often used to create headings in the findings section).

- Advance how the description and themes will be represented in the qualitative narrative.
- Interpret the data.

The coding of qualitative data can be developed on the basis of the emerging information collected, or predetermined codes can be used and the data fitted into them, or a combination of predetermined and emerging codes can be used (Creswell 2009:186-187). The coding should however address the following:

- Codes dealing with topics which are expected to be found based on past literature
- Codes that are surprising and expected
- Codes that are unusual and of conceptual interest
- Codes that address the larger theoretical perspective of the study

Bogdan and Biklen (1992:166-172) gave a list of the types of codes that can be used in analysing qualitative data, including setting, perceptions, process, activity and strategy.

For the purpose of this case study, a combination of predetermined and emerging codes was used to analyse the qualitative data. The predetermined theme codes used for analysis of the crime prevention methods/activities in this case study include the following:

- Situational (access control, target hardening, physical security)
- Environmental (natural surroundings, natural surveillance)
- Social (education, awareness, socio-economic upliftment)
- Law enforcement (community policing, collaboration)

(b) Structured incident questionnaire

In terms of the quantitative part of this case study, the structured incident questionnaire was focused on exploring the phenomenon of asset theft at the participating mine to enable the researcher to make recommendations on the most viable preventative strategy to address asset theft at the mine.

The quantitative data analysis steps described by Creswell (2009:151-153) were used to prepare for analysis of the structured incident survey responses of the case study.

The participating mine completed 6,045 questionnaires (as per Annexure B) for asset theft-related incidents recorded at the eleven South African mining sites of the

participating mine during the period 1 January 2006 to 31 December 2010. A representative response of the sample was therefore obtained.

The participating mine supplied electronically recorded data extract sets from the mine's central database in populated Microsoft Access Database Files which have been verified for content accuracy by the security manager of each mining site to use for validation of the information supplied on the questionnaires.

A variable is a characteristic or a condition that changes or has different values. In order to demonstrate changes in variables, it is necessary to measure the variables being examined (Gravetter & Wallnau 2008:5). When describing data, it is necessary to distinguish whether the data came from a population or a sample used for the research study. A characteristic that describes a population is called a parameter, which is usually a numerical value that describes the population and may be derived from a set of measurements from the population. A characteristic that describes a sample is called a statistic, which is a numerical value that describes a sample and may be derived from a set of measurements from the sample.

For purposes of this case study, the saturated sample comprising 6,045 asset thefts recorded at eleven South African mining sites of the participating mine was analysed using frequency data analysis. The aim of the survey was to establish the recorded losses, type of mine asset at risk, modus operandi used, and type of offender identified.

The statistical information was analysed using sums, cross tabulations and percentages to determine the extent of asset theft at the participating mine. This included the number of incidents, financial implications (both primary and secondary), time-line hotspots (month of year, day of week, time of day), type of property at risk, modus operandi used by the perpetrators, the type of perpetrators (employees, contractors or non-mine persons) where suspects had been identified, result of criminal cases (withdrawn, imprisonment, fines), and the type of mining site where the crimes most frequently occurred.

1.2.4 Reliability and validity

To understand the meaning of reliability and validity in research studies, it is necessary to consider the interpretation of researchers from different perspectives (Golafshani 2003:600).

The ontology – dealing with the nature of being – of postpositivists can be portrayed as critical realism, “real reality”, but is only imperfectly and probabilistically apprehensible

(Lincoln & Guba 2000:195-196). According to the postpositivist paradigm the extent to which results are consistent over time and represent the total population included in a research study accurately is referred to as reliability. If the results of a research study can be reproduced under a similar methodology, the research instrument is considered to be "reliable". Validity, on the other hand, is used to determine whether the research truly measures that which it was intended to measure and also how "truthful" the research results are (Joppe 2000:1).

Researchers state that historical research and descriptive studies are more concerned with finding new explanations and interpretations of existing information than collecting new information (Welman & Kruger 2001:180). In historical research, in view of the uniqueness of historical incidences, reliability and validity do not enjoy such a high priority as "replicability" (the extent to which measurement techniques constantly construct the same results). The scientific requirement of replicability does not refer to a repetition of events, but the ability to duplicate procedures, analyses and conclusions. Internal validity reflects the extent to which available sources make it possible to rule out alternative explanations or conclusions. External validity reflects the effectiveness with which the findings enable the researcher to predict the course of events in other times and places.

The use of primary sources is an important principle of historical research as the transfer of information from one source to another may be inadvertently distorted. In historical research, information from primary sources is usually obtained through purposive or snowball sampling and unstructured or semi-structured interviews. Information from both primary and secondary sources should therefore be subjected to stringent criticism. External criticism is directed at the genuineness and authenticity of the source whilst internal criticism reflects the accuracy or credibility of the contents of the source. The information that stood the test of internal and external criticism should be synthesised and interpreted in an attempt to propose explanations and correlations. Fundamentally such explanations amount to interpretations of the evaluated information by means of inductive logic.

While the terms reliability and validity are considered to be essential criteria for quality in quantitative paradigms, the terms credibility, neutrality or confirmability, consistency or dependability and applicability or transferability are considered to be the essential criteria for quality in qualitative paradigms (Lincoln & Guba 1985:300).

The term "dependability" in qualitative research closely corresponds with the notion of the term "reliability" in quantitative research (Lincoln & Guba 1985:300). The traditional

quantitative view of reliability is based on the assumption of repeatability. The idea of dependability, on the other hand, emphasises the need for the researcher to account for the ever-changing context within which the research occurs and is responsible for describing the changes that occur in the setting and how these changes affected the way the research is approached in the particular study. "Transferability" refers to the degree to which the results of the qualitative research can be applied to other contexts or settings.

Sustaining the "trustworthiness" of a research study depends on the issues, quantitatively, considered as validity and reliability (Lincoln & Guba 1985:266). The idea of discovering truth through reliability and validity is replaced by the concept of trustworthiness. The "credibility" criteria involve establishing that the results of the qualitative research are believable from the perspective of the participant in the research. "Confirmability" refers to the degree to which the results of the qualitative research could be confirmed or corroborated by others.

Although objectivity and truthfulness are critical to both qualitative and quantitative research, the criteria for evaluating qualitative research differs from quantitative research, however, as the researcher seeks believability based on coherence, insight, instrumental utility and trustworthiness through a process of verification rather than applying traditional validity and reliability measures used for quantitative research (Miller 1992:196). The value of qualitative research lies in the particular description and themes developed in context to the specific site and particularity is characteristic of qualitative research rather than generalisability. Qualitative reliability shows that the research approach is consistent across different researchers and different projects while qualitative validity indicates that the researcher checks for accuracy using validity strategies to assess the findings. Several reliability procedures are available, including the checking of transcripts for obvious mistakes and ensuring there is not a drift in the definition of codes (Creswell 2009:190-193).

Since there can be no validity without reliability, a demonstration of the validity is sufficient to establish reliability (Lincoln & Guba 1985:316). To ensure internal validity, the following strategies are used in this case study.

- *Triangulation* is defined as a validity procedure where researchers search for convergence among multiple and different sources of information to form the themes or categories in a research study (Creswell & Miller 2000:126). In addition, triangulation strengthens a study by combining methods using several kinds of data, including using both quantitative and qualitative approaches to test

for validity (Patton 2001:247). The research conducted in this case study includes describing the extent of asset theft (quantitative method) and the preventive approach (qualitative method) to address asset theft implemented by a South African mine, as well as literature reviews on available research pertaining to crime prevention strategies with the aim of recommending the most viable preventative strategy for the participating mine. If themes are established based on converging several sources of data, it can be claimed that the process has contributed to the validity of the study (Creswell 2009:191).

- *Member checking* is used in qualitative research methods to determine accuracy by referring the basic themes back to the participants for confirmation (Creswell 2009:191). In this case study the themes are established based on converging the perspectives from participants, the field notes of observations done by the researcher during site visits, and literature available on best practices in crime prevention. A representative of the participating mine was made available to validate the interpretations made by the researcher.
- *Spending a prolonged period in the field* contributes to the validity of a study as the researcher develops an in-depth understanding of the phenomenon being studied (Creswell 2009:192). The researcher developed the themes for this case study over a period of five years during which she had access to the participating mining sites and the participants.
- *Peer briefing* enhances the accuracy of the study and thereby the validity, as this strategy involves the interpretation of the data beyond the researcher (Creswell 2009:192). A social researcher of the Institute for Security Studies served as a peer reviewer to verify the accuracy of the interpretations made by the researcher as well as the correctness of the statistical findings.
- *Secondary audits* were applied to the research findings of the case study to ensure statistical validity and replicability. The measurement of the quantitative data was correlated and verified for correctness and meticulous record was kept of all information described in the study or used to base findings on.
- *Clarification of possible researcher bias* was described in section 1.2.1.1. This self-reflection creates an open and honest narrative that contains comments by the researcher about how his or her interpretation of the findings is shaped by background and experience (Creswell 2009:192).

1.3 ETHICAL CONSIDERATIONS

On 12 July 1974 the National Research Act was signed into law in the United States, thereby creating the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research which provides the basic ethical principles that

should underlie the conduct of research involving human subjects, generally referred to as the "Belmont Report". These "basic ethical principles" refer to the general judgements that serve as a basic justification for the many particular ethical prescriptions and evaluations of human actions that should be considered:

- *Respect for persons* incorporates at least two ethical convictions: first, that individuals should be treated as autonomous agents, and second, that persons with diminished autonomy are entitled to protection (United States of America 1979:4).
- *Beneficence* implies that persons should be treated in an ethical manner not only by respecting their decisions and protecting them from harm, but also by making efforts to secure their wellbeing (ibid:5).
- *Justice* means a sense of "fairness in distribution" or "what is deserved". An injustice occurs when a benefit to which a person is entitled to is denied without a valid reason, or when some burden is imposed unduly (ibid:6).

Applying these general principles in conducting research leads to the consideration of the following requirements:

(a) *Informed consent*

Informed consent in respect of persons requires that research subjects, to the degree that they are capable, be given the opportunity to choose what shall or shall not happen to them (ibid:7). The following needs to be considered in this context:

- *Information*: Most codes of research establish specific items for disclosure to ensure that subjects are given sufficient information. These items generally include the research procedure, the purposes, risks and anticipated benefits, and a statement offering the subject the opportunity to ask questions and to withdraw from the research at any time (ibid:7-8).
- *Comprehension*: The manner and context in which the information is conveyed is as important as the information itself (ibid:8).
- *Voluntariness*: Agreeing to participate in the research constitutes a valid consent only if given voluntarily (ibid:9).

An assessment of risks and benefits requires a careful arrangement of relevant data, which should present both an opportunity and a responsibility to gather systematic and comprehensive information about the proposed research (ibid:10-11).

(b) Selection of subjects

Similar to the principle of respect for persons – which focuses on the requirements of consent and the principle of beneficence with a focus on risk and benefit assessment – the principle of justice gives rise to moral requirements that there be fair procedures and outcomes in the selection of research subjects (ibid:11).

The ethical principles contained in the Belmont Report were considered while undertaking the case study. A comprehensive research proposal was presented to the head of security of the participating mine at the time in order to obtain “informed consent” to undertake the proposed research from the relevant authorities.

The “assessment of the risks and benefits” of the intended research was reviewed by an independent panel at the participating mine and written consent was given on condition that the identity of the participating mining company and all participants be kept anonymous and all information received be dealt with as confidential. A confidentiality agreement was signed by the researcher in this regard to ensure that all information obtained for research purposes will be secured and will be used for this case study only and not be disclosed to any other party or utilised for any other purpose.

As the researcher has acknowledged the obligation to respect the company values of the participating mine pertaining to safety, all site visits to gather information were conducted under the supervision of a safety officer or security officer.

In addition, the researcher applied the ethical standards of the University of South Africa as outlined in the Code of Ethics for Research (Technikon SA 2000) by using accurate referencing techniques, avoiding plagiarising, and acknowledging all sources of information used in conducting the case study.

1.4 CHALLENGES EXPERIENCED DURING THE RESEARCH STUDY

The researcher wishes to express her sincere gratitude to the participating mine for the opportunity granted to conduct this case study. The mine’s willingness to take part in the case study enabled the researcher to contribute towards a research topic that has not been explored commonly thus far in South Africa.

As with any research study, the researcher faced various research challenges and unanticipated difficulties, which will be discussed briefly below.

The research proposal for the case study was approved by the participating mine in January 2007. The initial timeframe decided on for the data collection phase of the research study was for the year 2007. The initial scope of the case study included analysis of the asset theft-related incidents recorded by the participating mine in the period January 2005 to December 2006. The first electronic dataset comprising the asset theft-related incidents recorded in the above period included 2,825 incidents and was made available to the researcher during 2007. Simultaneously, the researcher distributed open-ended interview questionnaires to the participants, and conducted follow-up interviews with the participants towards the end of 2007. The information gathered were analysed during the first semester of 2008 and the initial research report drafted. Shortly thereafter the researcher accepted a new position, which unfortunately allowed limited time to continue with the research.

Crime is an ever-changing phenomenon. For that reason, proactive strategies are continuously revised and updated to meet ever-changing security challenges. In order to ensure the case study remained valuable to the participating mine, the information pertaining to the asset thefts, as well as the crime prevention strategies continuously adopted to address the crime incidents, had to remain relevant in order to be useful. The timeframe for the case study was consequently adjusted to accommodate the researcher's limited availability and to accommodate the participating mine's need for an up-to-date research product.

The new timeframe increased the scope of the case study significantly, however. The number of recorded asset theft-related incidents increased from 2,825 to 6,045 (2006-2010) and more interviews with the participants were required each time another year's incidents were released to the researcher. This was done to ensure that the researcher remained up to date with changes in the proactive strategies and followed the concurrent embedded mixed methods research design principles in order to stay true to the approach selected for the intended research case study.

Chapter 2

A background to crime in South Africa

2.1 INTRODUCTION

The complex and various factors that contribute towards crime are now better and more widely understood than before (Homel 2004:1). These factors can range from aspects of individuals' personal characteristics and how they relate to their families and communities, through to social and structural factors such as access to and complete achievement and utilisation of health, education, employment and housing opportunities. Understanding the causes of crime also improve our understanding of the type and mix of measures that can be used to bring about sustained reductions and the long-term prevention of crime.

This chapter focuses on some of the perceptions of and theories about how the history of South Africa impacts on the overall crime threat faced by the country. When formulating an integrated and holistic crime prevention strategy, it is essential to appreciate the underlying factors that could contribute towards criminal behaviour.

At the participating mine, all crime incidents are reported to the security management department. This department is also responsible for conducting risk assessments and implementing security measures to manage the identified risks. An open-ended interview questionnaire was distributed to 15 security managers for completion prior to the interviews (see Annexure A). At the time the 15 participants collectively had 370 years' experience in the security field and 198 years' experience in the mining industry at the time (see Annexure C). Interviews with the security managers of the participating mine were conducted in 2007 and 2008 to contextualise the perceptions of the participants regarding the underlying causes of the crimes their mining company faced at the time. In accordance with the concurrent mixed methods approach used for this study, the literature review was done during the same period.

2.2 THE HISTORY OF CRIME IN SOUTH AFRICA

Butchart, Hamber, Terreblanche and Seedat (1998:237-238) stated that according to the Foucaultian perspective, a productive relationship exists between power and knowledge. An apparently objective phenomenon such as violence is in fact fabricated in historically

dependent ways as a result of this relationship. Simultaneous with the collapse of apartheid and progress towards democracy, the use of violence for sovereign ends was de-legitimised. The concern after the new democratic government had been implemented no longer was the demonstration of violence as a means to obtain political power, but rather the consequences of violence, which is reflected in the high levels of crime as well as the violent nature of crime prevalent in South Africa.

The social disorganisation theory, in contrast to other theories on the causative factors of crime, posits that crime occurs not necessarily where the opportunity for crime is the greatest, but rather where social structural factors produce an environment that is conducive to crime (Rice 2003:11). According to this theory, a post-conflict society would arguable be influenced in this way. Whilst the social disorganisation theory insists that spatial patterns of crime emerge because neighbourhood and community characteristics are susceptible to criminality, the routine activity theory, on the other hand, emphasises that spatial patterns of crime emerge as a result of contextual differences in opportunities for criminal acts (ibid:11-12). Given that a criminal event requires both a motivated offender and an opportunity, it has been recognised that these two theories, though independent, are complementary in nature. Characteristics associated with the production of criminality and the creation of opportunity may be independently associated with spatial patterns of criminal events, but when they occur simultaneously in the same location, the interaction may result in a multiplicative rather than an additive effect.

The routine activity theory further assumes that crime is engaged as a rational choice in which offenders attempt to maximise their gains and minimise their losses, proposing that crime is a result of routine activity (Clarke 1984:74-83). This theory perceives crime as a function of everyday behaviour, supposing that crime will occur more frequently where daily activities create the most opportunities for the most profitable crime and the least chance of retaliation. More specifically, the theory suggests that there are three basic elements of routine activity that influence crime rates: accessibility, guardianship, and target suitability. It is proposed that converting opportunity into criminal acts depends on the subjective evaluation of the ease and attractiveness of the perceived opportunity and that this evaluation occurs in the context of criminal motivation, experience and knowledge. Seen in the light of high levels of poverty and unemployment, crime levels would thus be influenced substantially.

2.2.1 Moral regeneration

Many participants in the case study mentioned a general lawlessness or low moral standards when reflecting on factors contributing towards crime in the mining industry. Participant 9 stated that the country has a "culture of entitlement", while Participant 1 remarked that a "national culture of lawlessness" prevailed.

Peter Gastrow, a crime analyst at the Institute for Security Studies in Cape Town, said in a news interview that South Africa is an extraordinarily violent society and that nobody knows the reason for this (Conroy 2006). There are plenty of theories, many tied to South Africa's unique history and the belief that the struggle against apartheid created a culture of lawlessness, but the reasons seem to be unbelievably complex. "There is no explanation that makes sense," Gastrow said (ibid). Mamphela Ramphela's response to South Africa's extraordinarily low score in the safety and security category in the 2008 Mo Ibrahim Index of African Governance, in which South Africa ranked 42nd out of 48 sub-Saharan countries, was that the culture of lawlessness was rampant. She said the police were deeply corrupt and that law enforcement authorities were weak and had never managed to get on top of the crisis (Pienaar 2008).

Simpson (1998:67-68) stated that the new democratic government had inherited many state institutions and personnel and with them, as a result of their functions under apartheid, inevitably a legacy of mistrust. The most widely distrusted government institutions during apartheid were the police, the justice system and correctional services. Despite various changes that were implemented, the criminal justice system had not yet produced new, legitimate and respected sources of social authority, with the result that a culture of impunity reigns. This enables criminals to operate freely and at the same time sanctions private justice, with the dangers of violent revenge that accompany it. Unrealistic expectations that better living conditions would be delivered swiftly once the democratic government takes the reigns were destined to cause deep-seated frustration. Although the political backlash that many feared has not occurred, the rising crime rate and rampant violence point to growing disaffection, especially among the young.

According to Leggett (2005:581-583) it is often argued that a crime wave following South Africa's transition to democracy was inevitable. Major political or social transitions seem to be accompanied by an increase in crime rates, as seen in the former Eastern Bloc countries. Many reasons for this phenomenon have been suggested, ranging from widespread social disorder to a deep sense of "normlessness" which in turn results in "lawlessness". Apartheid also relegated the majority of the people to poverty, and the

pace of social reform was tempered by the need to make the economy investor-friendly. It may be argued that people who had suffered so profoundly for so long are entitled to a little informal redistributive activity such as crime. In addition, post-conflict situations are generally characterised by more crime. After decades of systematic oppression some deep-seated hatred could be expected.

In June 1997 President Nelson Mandela, describing the spiritual malaise underpinning the crime problem, stated:

[Our] hopes and dreams, at times, seem to be overcome by cynicism, self-centredness and fear. This spiritual malaise sows itself as a lack of good spirit, as pessimism, or lack of hope and faith. And from it emerge the problems of greed and cruelty, of laziness and egotism, of personal and family failure. It both helps fuel the problems of crime and corruption and hinders our efforts to deal with them (Rauch 2005:15).

After the 1999 election, with Thabo Mbeki as president and Jacob Zuma as deputy president, a "moral regeneration" initiative to address this spiritual malaise began to enjoy more formal attention from the presidency. In dividing up political and administrative tasks between the president and deputy president, Zuma was allocated responsibility for this initiative. Staff in the presidency expressed it as a routine division of labour, with no great political significance. However, subsequent allegations of corruption levelled against Deputy President Zuma's financial advisor, and later his own involvement, led to various criticisms being voiced about his role in the moral regeneration initiative, often insinuating some political significance in his association with the campaign. The moral regeneration campaign had, however, been conceptualised as an expanding partnership between government and civil society (particularly faith-based organisations) who would engage in campaigning and other activities to rebuild the social fabric of society and improve the moral fibre of the nation. However, it never became clear what these activities should be or how they would rebuild morality in order to combat crime (Rauch 2005:23-25).

2.2.2 Violent nature of crime

Nearly half of the participants of this case study raised concern for the safety of employees and security personnel because of the growing incidence of violence and crime in South Africa. Participant 1 stated that crime is considered a "safety threat to workers in service" of the mining industry. Participant 4 subscribed to this view stating: "Crime is becoming a safety threat in the mining industry. Lives of employees are threatened." The participating mine had fallen victim to numerous armed attacks and in some instances, the consequences had been fatal. Participant 8 expressed concern

that “the better we protect our assets the more violent crime becomes”. In order to address the increase in violence, the participating mine replaced all response vehicles with armoured vehicles as part of their safety drive against violent crimes.

Crime and violence are arguably the greatest obstacles to a prosperous and peaceful South Africa where a society can live together free from fear and able to participate in all that the country has to offer (Holtmann 2008:13). The police has recorded nearly two million serious crimes each year during the period 2000 to 2007, more significantly, of these crimes, about a third are so-called “contact crimes” such as murder, hijacking, armed robbery and rape.

The distinctive feature of crime in South Africa is not the volume of crime but the violent nature of crime (Stone 2006:4). The homicide rate presents the extent of violence in the country most starkly. Although the rate has declined substantially since 1994 when South Africa recorded 67 murders per 100,000 people, it was reported to be at 40 for the period 2004/05, which is still among the highest national murder rates recorded in the world. Statistically a South African is 12 times more likely to be murdered than the average American and the chances of being killed are 50 times greater than if he or she lived in Europe (Conroy 2006). Markinor has been involved in public opinion studies on government performance since 1994, and when asking South Africans for the April/May 2007 study whether they perceived the crime rate to be on the increase, about three in every five South African adults (59%) indicated that they believed the crime level had increased. The remainder believed that it had either decreased (15%) or remained the same (24%). A small minority (2%) did not have an opinion at all (Harris & Radaelli 2007:1-3).

In July 2007, the Safety and Security Minister at the time, Charles Nqakula, addressed community policing forums (CPFs) and said that crime trends had been narrowed down to an increase of 2.4% in murder and 4.6% in aggravated robbery. The minister explained that the increases were the result of a spike in violent crime between April and June of 2006, which had not been emphasised. He added that “another critical factor that was overlooked was that this spike took place in the wake of the security strikes” (Sakoana 2007).

Official statistics released by the South African Police Service (SAPS) in 2006 and 2007 indicated significant increases in violent crimes. For the period April 2006 to March 2007, eight serious crimes were grouped together in a category for “contact crime” against the person. These crimes involve physical contact between the victims and offenders and were generally found to be of a violent nature. The crimes included in this category are

murder, attempted murder, rape, assault with the intent to inflict grievous bodily harm (GBH), common assault, indecent assault, aggravated robbery, and other robbery. The above crimes accounted for a disturbing 33.3% of South Africa's recorded serious crime in the corresponding period.

Moreover, theft had become violent, general thefts had decreased by 4%, and aggravated theft (robberies) had increased by 6% in the corresponding period. Aggravated robbery is the second-largest generator of contact crimes, particularly attempted murder and murder, because victims are often killed and/or seriously injured during such thefts.

The vast majority of house robberies, car-jackings, business robberies, cash-in-transit robberies and bank robberies are committed with firearms and shots are frequently fired at victims. In the period April 2006 to March 2007, a total of 197,714 robberies were reported to the SAPS. Robbery at business premises increased by 52.5% (from 4,387 cases to 6,689) in the period April to March 2006/07 compared to the corresponding period in 2005/06.

According to Burger (2007:1) when the SAPS released the above crime statistics, they confirmed what many had expected – that there had been a serious increase in violence in the country. Apart from murder and rape, aggravated robbery – certainly because of its nature and the violence or threat of violence associated with it – seems to be the most feared crime in the country (ibid:4).

In a press release in July 2007, the National Commissioner of the SAPS at the time, Jackie Selebi, said in response to the concerns expressed about the violence associated with crime in the country that “we want to assure all South Africans that we will continue to cut crime” (Hosken 2007).

Business Against Crime South Africa (BACSA) stated in a media release in June 2008 that despite the increased efforts of the police, they were deeply concerned that the crime level in South Africa remained unacceptably high and was exacerbated by the high levels of violence that threatened South Africans' feeling of safety and security. Although robbery with aggravating circumstances had decreased by 7.4% overall between the period 2006/07 and 2007/08, business robberies increased by 47.7% and truck-jackings by 39.6% (BACSA 2008).

The Institute for Security Studies (ISS) conducted the 2007 National Victim Survey with a design that was comparable with the 1998 Statistics South Africa Victim Survey and the 2003 ISS Victim Survey. In general the percentage of participants who had been

victims of crime decreased by 12% since 1998 and 4% since 2003. Compared to official SAPS statistics, the victim survey indicated significant increases in the robbery category, however (Pharoah 2008:7).

2.3 FACTORS CONTRIBUTING TO CRIME IN SOUTH AFRICA

Between January and March 1998 the Centre for the Study of Violence and Reconciliation (CSVR) conducted a survey research project by means of structured interviews with station commissioners at each of the police stations within the Greater Johannesburg Metropolitan area. Most of the responses of the 38 station commissioners to the question "What do you think are the main causes of crime, or factors contributing to crime, in your area?" indicated that they viewed the socio-economic situation and criminal organisations in South Africa as the major problems. Many alluded to factors in the category "community attitudes and values" that contribute to crime. These ranged from alcohol abuse – citing the frustration-aggression hypothesis and the absence of appropriate role models for young people – to the hostility and lack of co-operation the police experience in the communities they serve. Other factors mentioned included illegal immigrants, environmental factors, and aspects of urbanisation and development that may contribute to crime (Rauch 1998).

Between April and July 2000 the Community Agency for Social Enquiry (CASE) conducted a research study among youth in South Africa and carried out a survey in all nine provinces. The sample included 2,500 people between the ages of 16 and 35. When asked what they perceived as the main reasons for the high crime rate in South Africa, 72% of the participants ranked unemployment first, while 12% placed it second. The second reason given for the high crime rate was poverty. While unemployment and poverty are generally perceived to be the main factors contributing to crime, additional causes advanced by the participants included drug abuse, gangs, and people's perception that they would not get caught (Braehmer, Kimmie, Greenstein, Morake & Seutloadi 2000:81-82).

The 2007 National Victim Survey conducted by the ISS included 4 500 interviews conducted in all nine provinces in the period October-November 2007. The participants were randomly selected in a representative stratified sample of the national population over the age of 16. When asked, "What motivates most people who commit crime in your area?" in response to a question on to property-related crime, 43% of the participants indicated greed, 24% indicated that it was the result of real need, and 27% believed that property crime was committed for non-financial motives (Louw 2008:18).

In response to the question, "What do you think are the causative factors or general factors contributing towards crime in the mining industry?" the participants of the case study had similar responses to those highlighted in the above research studies. Most were of the opinion that the availability of assets (opportunity) as a result of a lack of proper security controls was an important factor contributing to asset theft in the mining industry.

More than half of the participants indicated that unemployment, poverty and poor socio-economic conditions greatly contributed to the high crime levels in the mining industry. Other factors cited by the participants included a general culture of normlessness (lawlessness), greed, urbanisation, and informal settlements, as well as a lack of awareness among employees.

Although various factors can contribute towards crime in South Africa, this case study will focus on socio-economic and developmental factors. These themes have emerged consistently in research studies undertaken in South Africa and were also highlighted by the participants.

2.3.1 Poverty and socio-economic factors

"The dismal shame of poverty, suffering and human degradation of my continent is a blight that we share. The blight on our happiness that derives from this ... leaves us in a persistent shadow of despair. This is a savage road to which nobody should be condemned." (Statement of Deputy President Thabo Mbeki at the adoption of the Republic of South Africa Constitution Bill, 1996)

Even in the post-apartheid era, deprivation among South Africans continues to pose a major social challenge to the country. People are confronted by the reality that some are still poor even after years of democracy (Mathole 2005:20-21).

The Poverty and Inequality Report (PIR) released by the South African Government in 1998 mentioned that the poverty phenomenon that is common to many countries can be seen as the inability of many to satisfy their essential needs while a minority enjoys extreme prosperity. The specificity of this condition in South Africa has mainly been the result of historically institutionalised discrimination. Colonial and Union government policies directed at the extraction of cheap labour were built upon by apartheid legislation. The result was a practice of state-driven underdevelopment that encompassed dispossession and exclusion for the majority of South Africans.

In response to the question what the participants of this case study considered the best and most effective way to deal with causative factors contributing towards crime in the mining industry, nearly half of the participants held the opinion that uplifting poverty in the communities situated close to the mining operations would decrease crime.

There is a complex relationship between crime and poverty (Rauch 2003:2-4). Although this relationship is not linear and it cannot be assumed that if poverty is addressed the crime problem will disappear, or that poverty is the sole contributing factor to crime, it is accepted that there is a causal relationship between the poverty in certain areas and the high levels of crime and violence recorded in these areas.

The relationship between crime, poverty, and social development has been the subject of various research initiatives (Frank 2006:95-96). A few primary themes have emerged from this debate, including the assertion that poverty, or a lack of development, causes crime.

Kothari (1993:113) defined poverty as a summation of a variety of concrete phenomena, which include growing disproportion in living standards, rising underemployment and unemployment, increasing marginalisation and declining access to vital and primary resources, social discrimination, and ecological deprivation.

Poverty is defined by Potgieter (1998:198) as a standard of living which is lower than the expectations of society or as a uniform gap between one's own resources and those of others. In this way poverty can also be seen as a lack of something others have and which the deprived person feels entitled to have.

Poverty and unemployment can be associated with certain crimes, according to Louw and Shaw (1997:4-5). But focusing on such structural features as causes of crime does not always explain crime patterns and trends in particular areas and is not particularly helpful to policy-makers. Poverty and unemployment often explain the contexts within which crime occurs, but in terms of patterns and trends, these arguments are too general and do not explain why crime rates are substantially higher in one area compared to other areas that are equally or more affected by unemployment and poverty.

The Development Policy Research Unit (DPRU) at the University of Cape Town conducted a post-apartheid economic and labour market review utilising data from the 1995 October Household Survey and the September 2003 Labour Force Survey. The findings indicated that while the South African economy created more than 2 million jobs between 1995 and 2003, unemployment levels were still showing a rapid increase. It was established that the narrow unemployment rate increased from 17.6% in 1995 to 28.2%

in 2003. Particularly among individuals between the ages of 15 and 34 years unemployment emerged as a serious problem, with the broad youth unemployment rate increasing from 40% in 1995 to 55% in 2003. This indicates that the rapid surge in the overall broad unemployment rate had been driven largely by rapidly rising unemployment among people between the ages of 15 and 34 (Bhorat 2005:3).

The South African Government has however acknowledged that poverty plays a major role in the high crime levels in the country. In March 2007 the then Minister of Finance, Trevor Manuel, stated in a press release that he could not fathom why the South African Government's commitment to fight crime was doubted, as every official from President Thabo Mbeki down had said on innumerable occasions that the crime rates in South Africa were unacceptably high. Evidence of the government's commitment, Manuel said, could be found in the massive resources allocated each year to the criminal justice system, as well as in its concerted campaign to address the root cause of crime, namely poverty. The financial resources budget to address crime for 2007 was estimated at more than R55 billion (Ensor 2007).

Participant 6 mentioned that the "lack of income due to unemployment drives people to commit crime in the hope to survive". Frank (2006:95-96) also stated that the causative link was announced together with a great deal of evidence linking crime and poverty.

Richards (2004:53-57) stated that poverty is characterised by the inability of individuals, households or even entire communities to obtain and sustain sufficient vital resources to satisfy basic needs. Many South Africans do not have access to the most basic required physical needs, including sufficient food, housing, clean water, health care, and education facilities. Without these, the deterioration of the body may impair or restrict mental vision and degrade the spirit. People that are deprived of basic shelter and on the edge of starvation cannot always make choices cognitively or attain self-fulfilment without crossing some lines. Millions of South Africans are severely affected by poverty and the increase in potential offenders should be seen against this background.

Participant 15 explicated that the "socio-economic conditions and poverty in informal settlements situated close to the mining areas create circumstances where desperate individuals who cannot find employment at the mines are recruited by organised criminal groups".

Poverty is often considered a product of a system of deprivation and insecurity, aggravated by a society that allows the conditions that create poverty to flourish. According to Van der Walt and Morolo (1996:136-138) this factor is significant in the South African context, where the development of the greater part of the population has

been negatively affected by apartheid policies, setting in motion conditions that trapped individuals, households, groups, and even entire communities in poverty.

Two key psychosocial consequences of the depth and pattern of inequality in South Africa are a profound sense of exclusion from the formal economy and the absence of hope that one will find a job. Income distribution among African-headed households was found to be much more unequal than in households of any other racial group. It appears that the discrepancy between the relative success of a minority of African-headed households and the continued poverty of the majority of African-headed households has led to an increased sense of relative deprivation. However, violence is not a response to economic inequality as much as it is a response to the dehumanisation and humiliation created by economic and social exclusion. Violence is, one might say, a reaction to the crisis of legitimacy surrounding all social institutions, each of which promises equality and opportunity but all of which fail to deliver (Altbeker 2008:39-48).

2.3.2 Urbanisation and developmental factors

According to Cox, Hemson and Todes (2004:2) migrant labour has a long history in South Africa and substantial literature and research developed around it and its socio-political significance, including Wolpe 1972, Mabin 1990 and Posel 2003.

Cox et al (2004:2-3) explained that the limits to permanent urbanisation instituted by the National Party came to be known as influx control, which in effect, served to perpetuate migrant labour. This is because Africans with the appropriate stamps in their passbooks could work as migrant workers in the so-called "white" cities without being permanent residents. Increasing numbers of migrant workers came from the old native reserves – the areas that were to become known under apartheid as the homelands – to the "white" cities. In that period apartheid and migrant labour benefited from fairly optimistic labour markets until at least the mid-seventies, but from then on formal work opportunities in the cities – and, more recently, on the mines – have been showing a dramatic decrease. Despite fewer opportunities, the number of migrant labourers has continued to grow, however.

In the 1997 Household Survey it was found that of the almost 65,000 black households identified, 21% included migrant workers. It can be argued that since crime and outbreaks of violence were prevalent in both the cities and in rural areas, having a base in both could allow criminals to move between the two as circumstances or opportunities change. The rural areas are also the place unemployed members of the household return to when they become unemployed. Some migrant workers expressed strong patriarchal

views in terms of family bonds, but many single mothers' attitude towards the old traditional views were deeply sceptical. These women increasingly had their "home elsewhere" and sooner or later broke their ties with the traditional "homelands". City women, on the other hand, are often viewed by their peers in the traditional rural areas as being "loose" or immoral as they are mostly perceived to be interested only in money. This is often believed to drive men to crime to satisfy their demands (Cox et al 2004:4).

Simpson (1998:66-71) stated that urbanisation under apartheid placed enormous pressure on family structures and destroyed the support structures of the extended traditional family. Traditional and customary legal structures were manipulated for the purpose of social control in the apartheid era. Schools operated as mechanisms of control and consequently lost their potential as places of social cohesion and identity for young people and became sites of political struggle. Young black people were educationally, economically, politically and emotionally disempowered. They proved resilient in the face of marginalisation, however, which led to the creation of new sub-cultures within political organisations, especially during the 1970s and 1980s. Before independence, and despite the government's apartheid policy, rural poverty caused massive migration to urban centres. Since migration was contrary to official policy, basic requirements such as housing, infrastructure and services were not provided to black South Africans living in urban townships. The perceptions of white-owned wealth amidst grinding poverty, massive unemployment, and scarcity of even basic resources eventually led to intense conflict, contributing to a situation in which criminal activity was generally seen as legitimate and socially acceptable.

The social disorganisation theory attributes variation in crime and delinquency to the absence or breakdown of communal institutions – for example family, school, church and local government – and communal relationships that traditionally encouraged cooperative relationships among people. The concept is mainly defined in terms of the absence or breakdown of certain types of relationships among people (Jensen 2003).

Urbanisation is a growing concern of the participating mine in terms of managing crime. Participant 8 explained that the general misperception people have that the "mining industry has everything in abundance" has led to "informal settlements rising on the boundaries of mining operations" and the "presence of refugees from neighbouring countries in these settlements, all hoping to get an income or job from these mining operations".

Another theme that relates to criminal acts as a barrier to development is corruption and fraud relating to services necessary for development, such as the delivery of social security. Crime within government, especially fraud and corruption, has a serious impact

not only on the nature and quality of service delivery, but on achieving the overall goals of democracy and development. The failure of government to deal effectively with internal fraud and corruption are highlighted by the public perception of government employees as corrupt and untrustworthy (Frank 2006:95-96).

In the African tradition, as in many other cultures, leaders are expected to be kind and compassionate towards their people, especially in difficult times. Africans may even end up condemning corruption when it does not benefit them personally or their relatives, while they condone it if it brings them some benefits. Furthermore, it is the African practice that young people who migrate to the urban areas in search of employment will rely on their more established relatives to provide food and shelter. Even more, if such a relative holds a senior civil service position, it will be expected of him or her to provide job security as well. Such age-old cultural expectations can easily nurture the practice of corruption in a new political environment (Balía 2005:56).

Fraud and corruption was also highlighted by the participating mine as a serious concern. Participant 1 commented on the importance to “establish strong supporting checks and balances to detect white collar crime”. Participant 10 boldly stated that “I am of the opinion that white collar crime poses the biggest risk to the industry” and added that “one needs to remember that these crimes are normally being committed by those whom you would never suspect of committing it, such as senior management with years of service. White collar crime can close a mine down completely.”

2.4 NATIONAL CRIME PREVENTION STRATEGY

“When sovereign and ministers show perversity of mind, it is impossible even for a Sun Tzu to encounter the foe.” (Sun Tzu in Giles 1910:7)

Du Plessis and Louw (2005:427) stated that South Africa's transition since 1994 has required an extensive overhaul of its institutions, laws and policing strategies. The period 1994-2004 in particular was characterised by the introduction of a number of new policies and legislation in the criminal justice sector. After 1994, one of the government's priorities was the introduction in 1996 of the National Crime Prevention Strategy (NCPS), which recognised the impact of social and developmental causes of crime, as well as the need to involve a range of government departments and civil society partnerships in addressing crime phenomena in a more holistic manner.

According to Rauch (2005:9) the link between criminal behaviour and the moral breakdown of a society is a very old one in social theory, pre-dating modern Western

sociology. In the NCPS the South African government linked the crime problem most strongly with the progression of the political transition that South Africa underwent in the early 1990s. In its study of the crime problem, the NCPS pointed out that the transition from authoritarian to democratic government resulted in significant implications for social cohesion and values. One of the aims of the NCPS in respect of public values and education was the development of strong community values and social pressure against activities which support criminal behaviour (Rauch 2005:12-13).

More than half of the participants recognised the importance of education and awareness as part of a crime prevention approach. Participant 15 emphasised that one of the most effective ways to address the increased levels of crime at the participating mine is to make use of "effective awareness campaigns and training of employees with a zero tolerance for crime policy".

According to the NCPS the violence and intolerance which had dominated the apartheid political culture was "spilling over" into the social and domestic arenas of the country. Criminalisation of political activity under apartheid had blurred the dividing line between political and criminal activity and criminals used this to rationalise their illegal activities. Law enforcement and criminal justice agencies had been discredited, which contributed to popular approval of illegal activities. The NCPS also emphasised the apartheid era's socio-economic legacy of "poverty, unemployment, and relative deprivation" as well as "youth marginalisation". Stark disparities in wealth, the NCPS said, operated as an incentive for criminal activity and, with political rationalisation, are even used as justification for crime. The NCPS indicated that South Africa was undergoing a new process of transition, and that the culture of violence and rationalisation of criminality were also reinforced by a "culture of entitlement" owing to expectations generated by the process of political change. The slow pace of change led to further frustration, however, contributing to an escalation in social conflict as well as violent and acquisitive crime (Bruce 2006:31-33).

In the opinion of Leggett (2005:590-594) the most common reasons for the increase in crime levels included the restructuring of the criminal justice system, initiating a period of reduced effectiveness. Furthermore, basic conflicts between the methods and strategies of the criminal justice system departments remain, as their operations seem "un-integrated". For example, the police strategy emphasises making massive numbers of arrests while the prosecutorial strategy emphasises cutting down on case backlogs and achieving more convictions. Then, of course, the prison system is on the receiving end, with the number of prisoners awaiting trial increasing as case backlogs grow. Prisoners are sentenced as convictions increase, which in turn makes the stated goal – rehabilitation – practically impossible. Democratisation implies greater concern for the

rights of the public, which often places an impediment on crime prevention. The South African crime policy debate has involved fundamental philosophical tension between two polarised perspectives on the best approach to address crime: the law enforcement approach and the crime prevention approach. The law enforcement approach is based on the premise that the best way to reduce crime is by jailing criminals. This incapacitates the problem individuals, at least for the period of their incarceration, and hypothetically serves as a deterrent to those who wish to avoid a similar fate.

However, it is also about rehabilitation, and thus opportunities and incentives for reform should be provided. In a society characterised by the kind of poverty seen in South Africa, poverty may to some extent counteract the supposed deterrence and opportunities of the corrective nature of incarceration. The crime prevention approach, on the other hand, is based on the notion that crime is caused by social conditions and that crime can only be addressed effectively addressing these underlying problems. Unfortunately, the causes of crime are often cast in the broad terms of poverty and inequality, which blurs the line between crime prevention and the social justice role. As a result the law enforcement approach is often seen as a long-term policy without any clear indication of responsibility.

According to Pelsaert (2007:2) the real issue is not so much that South Africa's crime prevention policy is wrong or ineffective, but that the rhetoric associated with the supposedly tough approach adopted by the police following the 1999 elections put the police at the centre of "a war against crime". This has allowed the then departments of Social Development, Education, Health, Housing and Transport to either ignore or abdicate their responsibilities in addressing crime with the result that the police continue to be seen – erroneously – as the primary crime prevention agency.

Participant 8 held the opinion that "very little can be done about the socio-economic situation because of the magnitude of the problem. The mining industry will have to accept the fact that they'll have to deal with the challenges themselves and that this responsibility will grow as conditions worsen and the conditions of other agents responsible to address crime deteriorate." Participant 10 stressed that "crime does not only pose a risk to the mining industry, but can affect the country and those who work for the industry directly".

2.5 SUMMARY

From the literature review above, it can be argued that understanding and addressing the underlying factors that contribute towards crime in South Africa could play an

important role in the effective implementation of the crime prevention strategy adopted by the South African Government.

In formulating a holistic and integrated proactive approach to curbing asset theft at the participating mine, the participants showed that they appreciated the fact that their crime prevention efforts had little chance of being successful if these external factors were not addressed as well. However, if addressing these external factors does not form part of their crime prevention strategy in a formal context, with clear objectives and properly governed action steps, it would be impossible to achieve the aim of reducing crime optimally.

When formulating a holistic and integrated crime prevention strategy, it is important not only to understand the factors contributing towards crime but also to reflect on the extent of crime in South Africa while considering, in depth, the nature of crime at the participating mine. This is done in chapter 3.

Chapter 3

The nature and extent of theft at a South African mine

3.1 INTRODUCTION

In this chapter the nature and the extent of asset theft at a participating mine are discussed to obtain a general understanding of asset theft with focused presentation and analysis of the collected data. Understanding this phenomenon is important not only when formulating a crime prevention approach applicable to the participating mine, but also when formulating strategies to address external factors that impact on the participating mine's efforts to curb asset theft.

Although the purpose of the research undertaken is to obtain a better understanding of the extent of asset theft faced by a particular participating mine, a brief overview of the occurrence of theft in South Africa is given to contextualise this phenomenon in the timeframe corresponding with the asset theft incidents analysed at the participating mine, namely the five-year period 2006-2010.

3.2 OVERVIEW OF THEFT IN SOUTH AFRICA

In the South African Police Service Annual Statistical Report of 2007 (SAPS 2007:2) it was stated that the government decided in January 2004 on a reduction target of 7% to 10% per annum for each contact crime over the period 2004/05 to 2014/15 in order to bring South Africa in line with the crime figures of the majority of Interpol member countries.

According to the Chamber of Mines, asset theft and illegal mining continue to threaten security personnel and employees at mines. Activities of illegal miners do not only impact on financial losses but, more importantly, pose a significant threat to the health and safety of employees. More and more homemade bombs are found and security personnel and the police members have come under fire. Criminal mining has become a serious problem and is now a major concern (Chamber of Mines 2010:125).

3.2.1 Overview of crime levels in South Africa from April 2006 to March 2011

According to Burger (2007:4-5) crime in South Africa remains a highly controversial and contested issue. In his review of the statistics released by the SAPS for the period

2006/07, he stated that the main message from the released crime figures was clear: "Whatever we as a country (not just the police) are doing to fight crime, is not working." In 2006/07 the rate of aggravated robberies increased by 4.6% to 267.1 per 100,000 or, in real terms, 126,558 incidents and business robberies increased by 52.2% from 3,320 incidents in 2004/05 to 6,689 in 2006/07. Burger (2007:5) stated that the figures clearly showed that there was something seriously wrong with the approach and the way in which the country's crime situation is presented, as the release of these statistics was once again overshadowed by explanations of why our crime is not as bad as it appears to be in an apparent attempt to underplay the gravity of the situation.

In a review of statistics released by the SAPS for the period 2008/09 Burger (2009:3) stated that a major concern about these crime figures was the continued increase in the so-called trio crimes (house robberies, business robberies and hijackings). For the first time house robberies and business robberies had increased in all nine provinces, while car-hijackings had increased in seven provinces. Aggravated robbery remained at a level between 200 and 300 per 100,000 and the 2008/09 figure of 249.3 was up by 0.8% from the 2007/08 figure. Business robberies were increasing at an even faster rate than house robberies, however. In the 2008/09 financial year this type of crime increased by 41.1% and by 54% since 2004/05. The hijacking of trucks, which has an obvious business connotation, increased at a faster rate than any other category. In the 2008/09 financial year truck hijackings increased by 15.4% and overall by 319% since 2004/05 (Burger 2009:7-10).

Statistics released by the SAPS for the period 2009/10 showed an overall increase in crime at a national level that was mainly driven by increases in five categories of crime, namely shoplifting, commercial crime, residential and business burglaries, and theft from motor vehicles. Business burglaries increased by 14% or 8,778 cases compared to the previous year and business robberies increased by 295.3% between 2003/04 and 2009/10 (Burger, Gould & Newham 2010:3-4).

Statistics released by the SAPS for the period 2010/11 (1 April 2010 – 31 March 2011) reflected a total of 2,071,487 (approximately 2.1 million) serious crime cases reported nationally. Property-related crime comprised 26% (534,451 cases) of the serious crime categories and contact crime a further 31% (638,468 cases) including 156,346 robberies. The violence associated with property-related crimes remained a concern for the country (SAPS 2011:1-5).

3.2.2 Theft of non-ferrous metals in South Africa

According to Participant 15 the international copper prices increased drastically over the last few years, resulting in a lucrative black market and consequent greater interest in copper and cable theft. "Currently copper and cable theft poses the biggest threat to the mining industry in terms of secondary impact including risk to life and production losses. Management subsequently classified copper and cable theft as one of the Top 5 priority crimes" at the participating mine. Theft of non-ferrous metals will therefore be explored in this section, as it is one of the assets considered by the participating mine to be a priority asset at risk.

At the 6th annual revenue protection conference of the South African Revenue Protection Association (SARPA) in July 2002, Leon van den Berg, the chairman (at the time) of the South African Non-Ferrous Metal Theft Combatting Committee (NFTCC), stated that an increase in copper and aluminium thefts in particular had become a serious problem in South Africa. In the decade 1992-2002 copper and cable theft had escalated to such an extent that losses ran into millions of rand annually. In the financial year 2001/02, Eskom, Telkom and SpoorNet alone lost more than R300 million rand as a result of non-ferrous metal theft. Johannesburg's City Power spent more than R25 million on the replacement of stolen cable in the year 2000. It was estimated that non-ferrous metal thefts, mainly copper cable thefts, in the year 2001 resulted in a total cost to these industries of more than R500 million and a cost of more than R1 billion to the economy of South Africa (Van den Berg 2002).

Dawie Cronjé, vice-president of the Electrical Contractors' Association (ECA) in 2006, stated that while copper theft was an ongoing problem, "of broader concern is the fact that such organised, skilful and resourceful criminals are able to operate so effectively, not only in the commission of the robberies themselves, but also in the effective and profitable disposing of the stolen goods". Cronjé added that "if these robberies are to become the benchmark of crime in the construction industry, the industry will be brought to its knees long before 2010" (Gifford 2006). Johannesburg police spokesperson in 2006, Superintendent Chris Wilken, stated that the government was aware of ongoing copper theft and that the copper is mostly sold to scrapyards. The dealers who bought the stolen metal, however, are obliged to be registered as second-hand dealers and must be able to account for their goods or face criminal charges and the closure of their business. Wilken said that "it's not the small guys who are the major worry; it's the organised syndicates who pull kilometres of cable out of the ground and have a whole system in place. In those cases there are often industry insiders involved" (Gifford 2006).

The previous police commissioner, Jackie Selebi, made a startling claim at a meeting of the National Council of Provinces' (NCOP) select committee on security and constitutional affairs in 2007, stating that an organised crime syndicate was attempting to slow down the country's economic growth through massive cable theft and crippling power outages. Selebi said he had initially thought too that cable theft represented isolated incidents by individuals who wanted to make a quick buck. Selebi stated that Germiston in Gauteng had experienced the most cable theft and explained that "there's a reason for that. Germiston has a railway station where a lot of the country's industrial cargo passes through, especially cargo going to industrial areas of Gauteng. If you take that cable wire you are in fact stopping the economy from growing, you're slowing the economy." Selebi further stated that he reached a conclusion that it was highly organised and had instructed his intelligence people to investigate the possibility of a major criminal organisation seeking to create "unnecessary problems" (Peters 2007).

Councillor Pieter van Dalen, then chairperson of the City of Cape Town's task team, the Copperheads, said the unit had been instrumental in many copper theft arrests and had racked up almost 100 arrests in six months in the period 2007/08 (Booyesen 2008).

Copper cable theft cost Telkom about R863 million between April 2007 and the end of January 2008 alone. Telkom had and would continue to "fight back" by installing alarms on critical cable routes and by employing armed security firms. Since routes had been fitted with alarms, 1,043 people had been arrested resulting in 157 convictions (SAPA 2008).

According to the Transport Minister at the time, S'bu Ndebele, copper theft from railway lines of the Passenger Rail Agency of South Africa (PRASA) has cost the country nearly R14 million in the period 2006-2009 (Lund 2010). Transnet Freight Rail spent at least R30 million on replacement costs due to copper theft in 2009 and Eskom another R38 million. The combined losses incurred by Transnet and Eskom due to copper theft increased by more than 38% in 2008/09 and replacement costs increased by 57%. The Democratic Alliance (DA) stated that it is estimated that South Africa lost approximately R7 billion per year to metal theft (Phakathi 2010).

According to the Chamber of Mines (2010:56), cable theft continued to impact on the heavy-haul Sishen to Saldanha ore railway line and Transnet and the mining companies were attempting to address the various problems that continue to inhibit further growth. About R400 million was allocated to theft management on the Transnet Freight Rail and crime prevention (Chamber of Mines 2010:82).

Non-ferrous metal theft is a national problem that is faced not only by the participating mine, or even the mining industry, but is a serious problem that impacts on various industries. Therefore, in this case study, non-ferrous metal theft-related incidents will be highlighted during analysis of the data to establish the extent thereof at the participating mine.

3.3 ANALYSIS OF ASSET THEFT AT A SOUTH AFRICAN MINE

The participating mine records every asset theft incident at its mining sites in a standardised crime information system. The security manager of each mining site verifies the correctness of each electronically recorded incident before it is stored in an electronic database. For the purpose of this case study, the participating mine provided a general description for terms frequently used in the reporting of the participating mine's crime incidences (see Glossary of Terms).

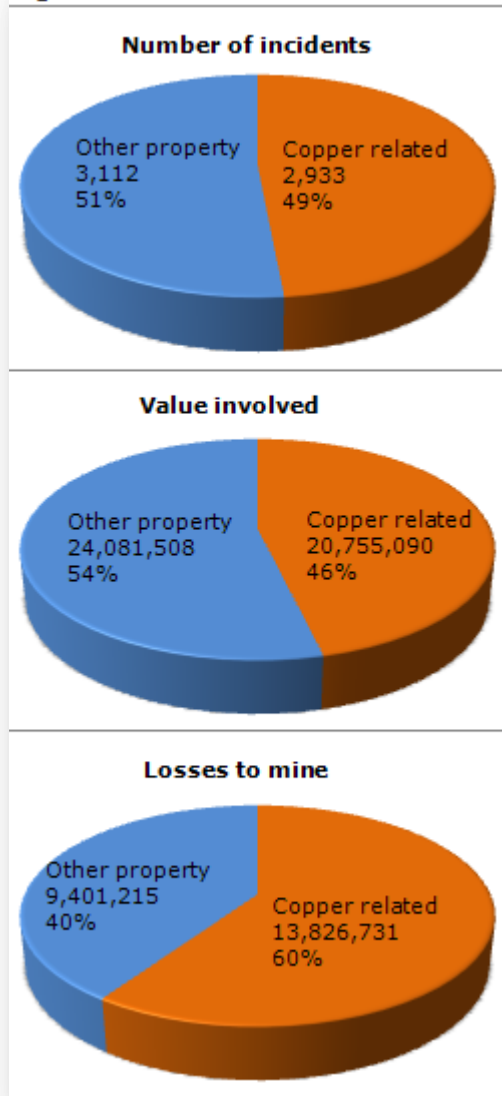
Owing to the sensitivity of prime product-related thefts, the participating mine excluded prime product-related incidents, but agreed to make all the required information available to the researcher for every other type of asset theft-related incident recorded at each of the eleven South African mining sites during the period under review.

To establish the extent and nature of asset theft at the participating mine, every asset theft-related incident, excluding the prime mining product of the participating mine, that was recorded in the period 1 January 2006 to 31 December 2010 was selected for analysis. In this period, a total of 6,045 asset theft-related incidences (excluding product-related thefts) were recorded at the participating mine and consequently the participating mine provided electronic datasets for 6,045 completed questionnaires (see Annexure B).

3.3.1 Overview of the period 1 January 2006 to 31 December 2010

Theft-related incidents of property belonging to the participating mine including any movable items such as tools, equipment, personal belongings of personnel and vehicles are grouped for the purpose of this analysis under "other property" and any copper or copper cable theft-related incidents are grouped under "copper related".

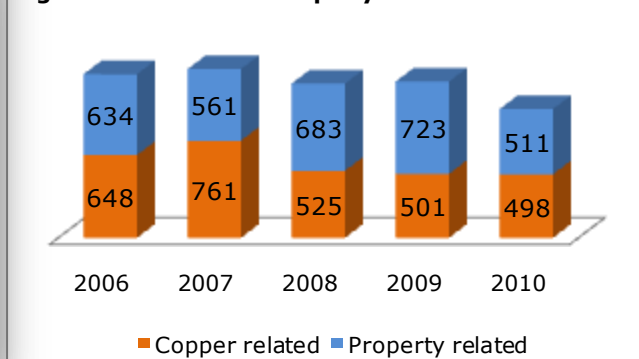
Figure 3.1: Asset thefts: 2006 to 2010



In the five-year period under review, copper-related thefts (2,933 incidents) comprised nearly half of the asset thefts (6,045 incidents) recorded at the participating mine as indicated in Figure 3.1.

With regard to the value involved in these recorded incidents, copper-related incidents comprised 46% of the total value involved (R44,836,598), while the losses the mine recorded due to copper-related incidents comprised 60% of the total losses recorded (R23,227,946) at the participating mine for asset thefts in this period.

Figure 3.2 : Asset thefts per year



Looking at a year-on-year comparison of these incidents, copper-related incidents

| Category | Year | Number of incidents | % Increase/decrease |
|------------------|------|---------------------|---------------------|
| Copper related | 2006 | 648 | |
| Copper related | 2007 | 761 | 17.4% |
| Copper related | 2008 | 525 | -31.0% |
| Copper related | 2009 | 501 | -4.6% |
| Copper related | 2010 | 498 | -0.6% |
| Property related | 2006 | 634 | |
| Property related | 2007 | 561 | -11.5% |
| Property related | 2008 | 683 | 21.7% |
| Property related | 2009 | 723 | 5.9% |
| Property related | 2010 | 511 | -29.3% |

constitute consistently between 40% and 60% of the total number of asset theft incidents recorded. During 2007, copper-related incidents constituted 58% of the recorded asset theft incidents, but in 2008 and 2009 less than 45% of the recorded asset theft incidents (see Figure 3.2).

In 2007, copper-related incidents reached the highest recorded level during the five-

year period, with a total of 761 copper-related incidents (see Table 3.1). This is an

increase of 17% over 2006, while other property-related incidents decreased by 12% in 2007 compared to 2006. During 2008, however, copper-related incidents decreased by 31% compared to 2007 and in 2009 decreased a further 5% compared to 2008. Other property-related incidents increased by 22% during 2008 compared to 2007 and by a further 6% during 2009 compared to 2008.

The participating mine explained that the increase in the international copper price and accessible black market in South Africa largely contributed towards the increases and decreases in copper-related incidents at the mine. According to Participant 15, during an internal crime analysis study conducted, a strong correlation was found between the international copper price and the threat of copper-related thefts at the mine, with a further “displacement” correlation between the threat of copper-related incidents and other property theft-related incidents. When the international copper price decreased, a corresponding decrease in copper-related incidents occurred while other property-related thefts showed an increase.

Table 3.2: Increase or decrease in value involved

| Category | Year | Value involved | % Increase/decrease |
|------------------|------|----------------|---------------------|
| Copper related | 2006 | 2,208,465 | |
| Copper related | 2007 | 4,660,320 | 111.0% |
| Copper related | 2008 | 2,846,008 | -38.9% |
| Copper related | 2009 | 4,343,487 | 52.6% |
| Copper related | 2010 | 6,696,811 | 54.2% |
| Property related | 2006 | 5,741,242 | |
| Property related | 2007 | 3,561,632 | -38.0% |
| Property related | 2008 | 5,616,851 | 57.7% |
| Property related | 2009 | 4,871,133 | -13.3% |
| Property related | 2010 | 4,290,650 | -11.9% |

Looking at the values involved in the recorded incidents, it was found that while the number of copper-related incidents decreased by 5% during 2009 compared to 2008, the value involved in the incidents increased by 53% and by 54% in 2010 compared to 2009 (see Table 3.2). Simultaneously, during 2009 other property-related incidents increased by 6% while the value involved

decreased by 13% compared to 2008. There was a further decrease of 12% during 2010 compared to 2009.

Table 3.3: Increase or decrease in loss to mine

| Category | Year | Total losses | % Increase/decrease |
|------------------|------|--------------|---------------------|
| Copper related | 2006 | 880,082 | |
| Copper related | 2007 | 2,481,206 | 181.9% |
| Copper related | 2008 | 1,076,758 | -56.6% |
| Copper related | 2009 | 2,343,032 | 117.6% |
| Copper related | 2010 | 2,438,038 | 4.1% |
| Property related | 2006 | 1,263,794 | |
| Property related | 2007 | 2,369,472 | 87.5% |
| Property related | 2008 | 2,140,254 | -9.7% |
| Property related | 2009 | 2,351,694 | 9.9% |
| Property related | 2010 | 1,276,001 | -45.7% |

When examining the losses recorded during this period for copper-related incidents, it was found that there was a significant increase of 182% in 2007 over 2006 (see Table 3.3). Analysing the dataset, it was established that one incident of theft of copper coolers at a smelter during 2007 represented a loss of R1 million which largely contributed

towards this increase. It was also found that while the value involved in copper-related

incidents increased by 53% during 2009 compared to 2008, recorded losses for this period increased by 118%. No single incidents with high losses were found in the dataset to explain the significant increase in losses found during 2009, however.

The participating mine explained that during 2009, the criminal threat changed from opportunity crime to organised crime and the mine had to contend with trespassers accessing redundant underground mining areas to steal copper cable. According to Participant 14 this phenomenon was found to be highly organised. It was established from arrested offenders that the trespassers were mostly illegal immigrants recruited in informal settlements about 100 kilometres from the mining operations. They were dropped off by vehicles at redundant mining operations in groups of 12-18 persons and picked up after two to three weeks. The trespassers were provided with food, water and tools to remain underground for a prolonged period. Access to the redundant underground mining areas was mostly gained at night at old ventilation shafts in remote areas and the trespassers would exit again at night through these "holings".

While offenders who operate on the surface are limited in what they can conceal and carry, the underground thieves had weeks to strip the copper cable and were able to move vast amounts of stolen copper, thereby increasing the losses exponentially (see Figure 3.3). Analysing the dataset, it was found that losses recorded from underground copper-related thefts showed a significant increase (779%) during 2009 over 2008. It reflected the highest recorded loss due to underground copper-related thefts in all the other years in the dataset and comprised 63% of said losses.

Figure 3.3: Photograph of redundant underground mining operation after copper cable theft



In addition to the R9,219,115 losses that the participating mine recorded pertaining to copper-related incidents in this five-year period, an additional R4,607,616 in production losses was recorded as a result of copper-related thefts, mostly when cables that provided electricity to operations were cut and downtime in production was experienced (see Annexure D, Table 1). During this period only five incidences resulted in production downtime, yet more than R4 million was lost. Thefts itself is therefore not the only financial risk faced by the participating mine – the potential financial impact owing to production downtime is even more disconcerting.

Participant 5 indicated that copper-related thefts pose the most significant threat to the participating mine as it could have a “huge financial impact, not only through direct loss but also through indirect loss through loss of production and very expensive preventive [security] measures”. The point was also made that copper and cable theft posed a significant safety risk as it may cause failure of ventilation to underground operations that could result in serious injuries and even deaths.

Various additional preventive measures were therefore approved to address copper-related thefts. These included the installation of alarms to identify power surges in cable, the erection of electric fences around high-risk areas such as cable yards, an increase in searches and patrols, as well as the installation of additional surveillance cameras. According to Participant 11 the “hardening of cable yards” and access points to cable yards had led to a decrease in copper-related thefts.

| Table 3.4: Value involved per incident | | |
|---|----------------|------------------|
| Value per incident | Copper related | Property related |
| R0 - R1,000 | 1,305 | 1,704 |
| R1,001 - R5,000 | 967 | 822 |
| R5,001 - R10,000 | 296 | 255 |
| R10,001 - R25,000 | 213 | 191 |
| R25,001 - R50,000 | 75 | 75 |
| R50,001 - R100,000 | 50 | 33 |
| R100,001 - R250,000 | 20 | 19 |
| R250,001 - R500,000 | 6 | 7 |
| R500,001 - R1,000,000 | 1 | 4 |
| R1,000,001 - R1,250,000 | 0 | 2 |

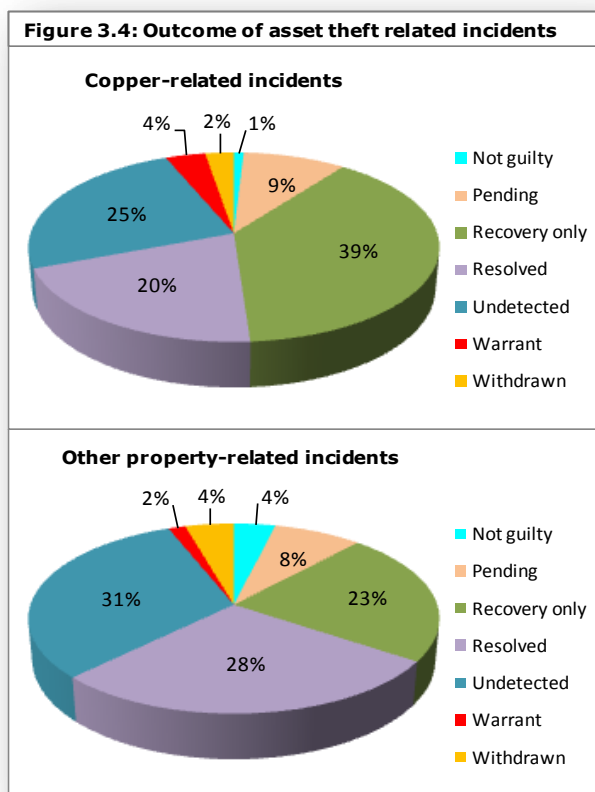
Looking at the value involved per incident during the period under review, it was found that nearly 80% of the incidents had a value of R5,000 or less (see Table 3.4). Only 1% of the incidents had a value of more than R100,000. It is therefore evident that asset theft poses a distinctive and strategic

challenge to the mine as only a few incidents resulted in significant financial risk.

During a study conducted by the ISS into the mining industry in South Africa it was found in the dataset that 76% of participants believed that good salaries could prevent theft from mine premises. Furthermore, 81% of the participants were of the opinion that positive rewards for reporting crime are an important method to prevent theft from mines. Participants were also asked to choose which action mine management should

take against perpetrators of mine-related theft. The categories included 'dismissal and/or a criminal charge'; 'transfer to a lower-risk area' and 'nothing'. It was found that 91% of the participants suggested that mine management favoured 'dismissal and/or criminal charges' to deal with offenders. Participants' opinions and attitudes regarding the imprisonment of convicted offenders for mine-related theft were also tested. Sixty-four per cent of participants thought that instituting a minimum prison sentence for convicted offenders of mine-related theft would prevent theft. Participants also reacted to possible prison sentences for certain crime categories, and 72% suggested a prison sentence of more than five years for convicted offenders of theft from mine premises (Coetzee & Horn 2007:53-56).

The security division of the participating mine investigates all asset theft-related incidents and also report them to the police. This division is also responsible for presenting the incident (case) at disciplinary proceedings if the offender was employed by the mine. The participating mine has a strict policy against crime that stipulates that employment contracts can be terminated should an employee be found guilty of a theft during a disciplinary proceeding. The participating mine also has a "whistleblower" initiative in place to encourage reporting of crimes and cultivate crime awareness among its employees. In addition, the participating mine uses crime prevention campaigns to advocate "zero tolerance" for crime.



This comprehensive approach of the participating mine in creating crime awareness becomes clear when the outcome of the recorded asset theft incidents is analysed.

The 'resolved' category in Figure 3.4 refers to all incidents where an offender had been identified and was found guilty at either a disciplinary proceeding and/or a criminal court proceeding.

The participating mine has a fairly good 'resolve' rate of 20% in copper-related incidents and 28% in other property-related incidents. Only 25% of the finalised copper incidents and

31% of the other property-related incidents were closed as undetected without any recovery. Of all the copper and other property-related theft incidents that were finalised, a notable 60% were closed successfully, with either a guilty finding and/or a recovery made.

3.3.2 Assets at risk

As mentioned above, copper-related incidents represented nearly half of the asset thefts recorded during the period analysed.

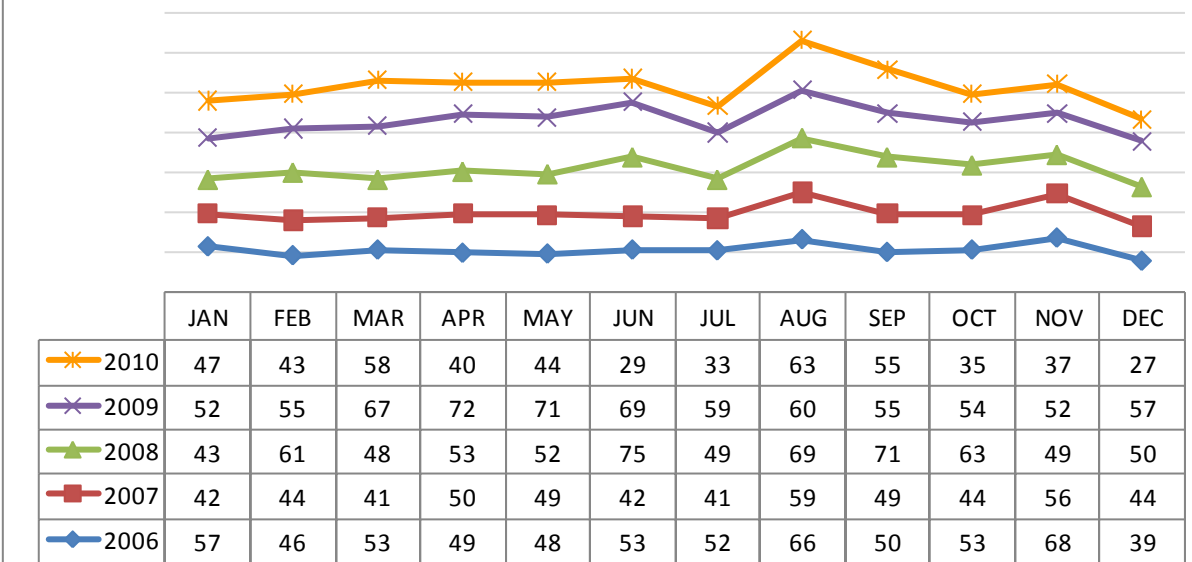
Looking at other property theft-related incidents, more than half (58%) of the incidents involved items that are easily disposed of, for example equipment or tools, cell phones, laptops, computers or computer parts, cameras, radios, and appliances such as television sets. A further 17% of the incidents involved items that the offenders could use themselves, such as cash, clothing, consumables, petrol or diesel, batteries and furniture (see Annexure D, Table 2).

The most significant assets at risk in the dataset included equipment or tools (36%); aluminium, corrugated iron or steel (9%); laptops, computers or computer parts (9%); and cell phones (7%).

A review of the type of asset involved per year indicated that aluminium, corrugated iron and steel only become a problem in 2009 when it comprised 16% of thefts. This type of theft continued to be a problem in 2010 when it comprised 13% of incidents. With the increased focus on copper-related thefts that includes target hardening at cable yards and increased access control at the participating mine, it can be argued that other types of non-ferrous metal (like aluminium) are increasingly targeted as it becomes more difficult to steal copper cable.

Other asset thefts that can be highlighted include the theft of paint, which was a problem during 2006 (7%) and 2008 (8%); the theft of building material or furniture, which was a problem in 2006 (6%) and 2007 (6%); and theft of consumables, which was a problem during 2007 (8%) and 2009 (6%) as well as during 2010 (8%). These types of assets can be used by the offenders themselves or sold to other individuals. Unlike stolen copper, disposing of these types of assets does not require an organised "black market". From the sporadic patterns in the dataset it can be deduced that certain types of assets are targeted at times when there is less demand for copper in the "black market". As mentioned above, during an internal review the participating mine found a strong correlation between international copper prices and increases and decreases in copper-related thefts.

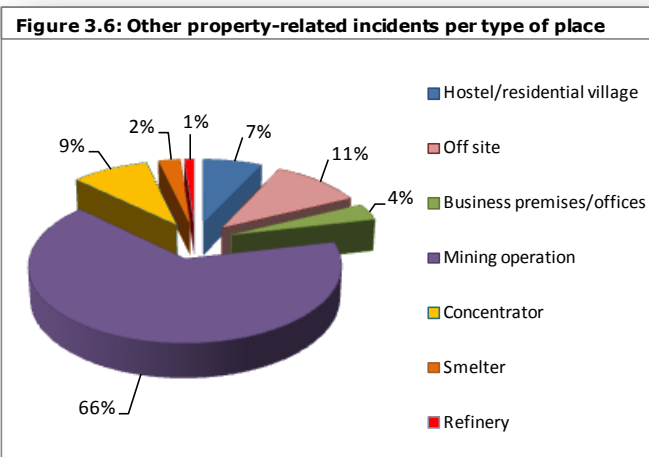
Figure 3.5: Other property-related asset thefts per month



Trends over the five years of the period reviewed have indicated a fairly constant pattern (see Figure 3.5). There is a gradual increase in incidents to June, just before the school holidays. The number of incidents decreases during the school holidays in July with a peak in August just after the holidays. A consistent gradual decrease is then seen towards the end of the year with a small increase in November just before the beginning of the school holidays in December.

The month August featured the most prominently (10% of the total incidents), followed by September (9%). The lowest number of incidents were recorded in July (7.5%) and December (7%). This could be ascribed to fewer security operations since security members are on leave during school holidays and/or to employees only noticing or

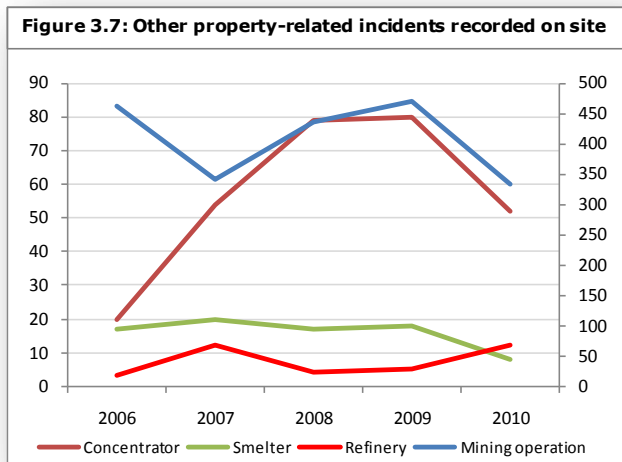
reporting missing property after they return from leave.



Looking at the type of place where other property-related incidents took place in the period under review, it was found that most incidents (66%) occurred at mining operations (see Figure 3.6). This is not surprising, as it is the lowest prime product sector and since the risk of

product theft is low, security measures are not biometrically or technologically enhanced. The mining operations also have vast areas (up to 250 square kilometres) to protect.

These are not only located near informal settlements but also have the highest number of employees and contractors to manage during access control (up to 5,000 employees are on duty per shift).



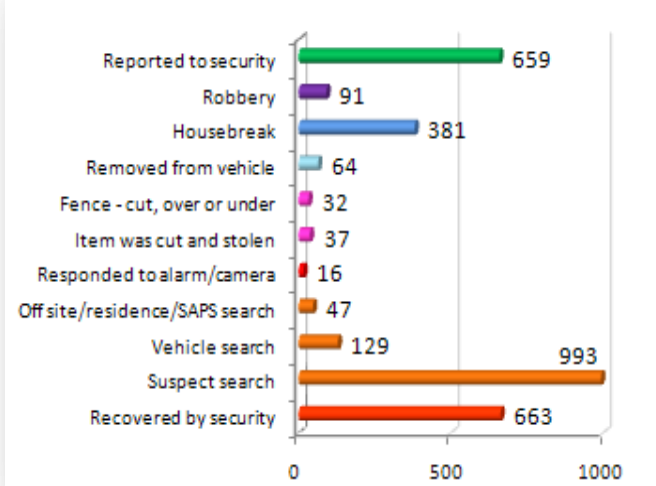
Looking at “on-site” incidents (thus excluding incidents that occurred off site or at hostels and residential villages) the refinery, which is the highest risk sector, only accounted for 1.4% of the incidents. This is understandable as such areas have state-of-the-art security measures in place, including X-rays when employees exit the highest risk levels (see Annexure D, Table 3).

The smelters, which represent the area with the second highest risk, accounted for 3.1% of the “on-site” incidents while the concentrators – the third-highest risk area – accounted for 11.1% of “on-site” incidents. During 2007, there was a notable increase at all three the high-risk areas, while there was a significant decrease at the low-risk mining operations (see Figure 3.7). In 2008 and 2009 there was a slight increase in the categories “mining operations” and “concentrators”, while the two highest-risk areas (refineries and smelters) showed a gradual decrease. In 2010 there was a significant decrease at the mining sites and a significant increase at the refineries. The highest-risk areas accounted for nearly 3% of “on-site” incidents, the highest recorded during the five years.

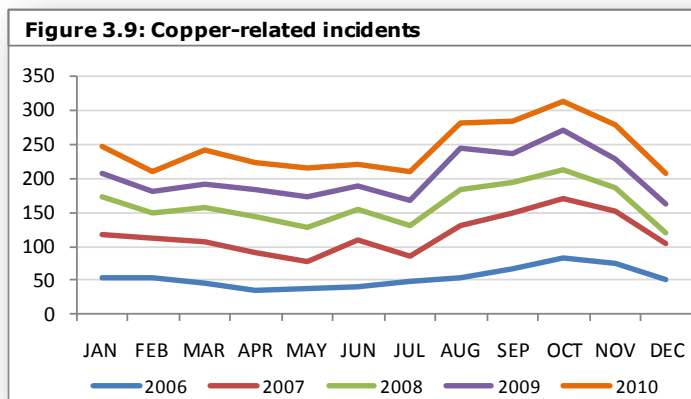
The participating mine explained that in 2010 various physical security measures had been increased at the smelters in particular as part of a long-term strategic plan. In addition, a more proactive security strategy was implemented during 2010 which focused on more disruptive security operations at the mining operations and the concentrators in particular.

Changes in the strategic security plan could have contributed towards a crime displacement phenomenon whereby offenders targeted higher risk areas more often during the security clampdown at lower risk areas. Participant 6 mentioned a similar pattern found when new physical security measures were implemented at high risk areas on the refinery and pointed out that “as target-hardening techniques and other crime prevention measures were implemented in the high risk area, the threat just moved to our low-risk area”.

Figure 3.8: Other property-related incidents per detection method



accounted for nearly 60% of detections of property-related incidents (see Figure 3.8). Items were mostly concealed on the person (32%), recovered in vehicles exiting the mine premises (4%), or recovered at the residences of identified suspects (2%). A further 21% were recovered during patrols. Only 21% of the incidents – of which 16% occurred off site – were reported to the security division.



A few tendencies could be identified in the dataset (see Annexure D, Table 4). For example, robberies occurred mostly (67%) off site and the suspects were commonly armed with firearms or knives. Most of the housebreaking incidences (55%) occurred off site at the residences of employees living in mine accommodation, or on site at training facilities or offices. Security searches or patrols

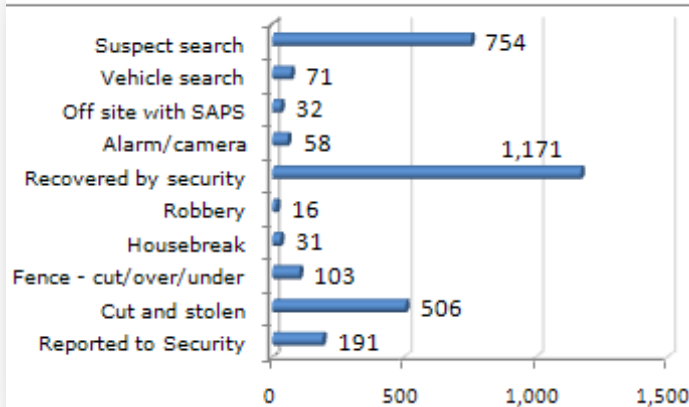
Looking at the number of copper-related thefts per month, a similar, consistent pattern is apparent in the five years under review (see Figure 3.9). There was a gradual decrease towards July followed by an increase in August to October and another decrease towards December. It can be assumed

that owing to the available black market and fluctuation in the international copper price, copper always poses a risk and incidences occur as the opportunity arises.

During the five-year period more than 70% of copper-related incidents were detected by the security division of the participating mine with either suspect searches (26%), vehicle searches (3%), or searches conducted in collaboration with the police at the residences or business premises of identified suspects (1%). A further 40% of the incidents represented recoveries made during routine patrols or were responses to alarms or camera surveillance (2%) as reflected in Figure 3.10. Most incidents occurred at lower-

risk mining operations, namely at shafts (49%) and at pump stations or sub-stations

Figure 3.10: Copper-related incidents per detection method



(11%). Other significant areas where copper-related incidents occurred included cable racks (6%), cable yards (6%) and waste dumps (4%). Only 1% of the incidents occurred at the high-risk smelters while less than a half per cent occurred at the highest-risk mining areas, namely the refineries (see Annexure D, Table 5).

Cable theft creates a unique challenge for the mining industry, as some of the exposed surface cable is used for ventilation fans servicing underground mining operations. Should the “wrong” cable be cut, thousands of underground workers could be exposed to a life-threatening situation that could result in fatalities.

Of great concern is the fact that 5% of the incidents in the period under review occurred underground, posing another significant safety risk to the mine. Since illegal mining is conducted without supervision and no mining safety procedures are adhered to, the significant increase in illegal underground mining activities in South Africa is cause for serious concern. Illegal mining is not only regarded as a security issue but also a safety issue that has a serious impact on the physical structure and layout of mines, with potentially disastrous consequences. Illegal miners minimise the risk of discovery by restricting the number of times they enter the mining operations and exit the mineshafts. Such miners have been found to stay underground for extended periods of time. They travel several kilometres underground to reach a safe remote area where they set up a base camp for the duration of the illegal mining operation. Redundant sites, closed off areas, tunnels that are not being mined at present, and areas considered unsafe for commercial mining are the most common places where illegal mining occurs. Arresting illegal miners has also become more dangerous in the past few years as violent resistance with firearms and explosives occurs more frequently. Since it is extremely dangerous to discharge a firearm in some underground places owing to the presence of explosive gases such as methane, mine security personnel do not as a rule carry firearms underground. They are consequently unable to defend themselves effectively in a confrontation where firearms and explosives are used by illegal miners (Coetzee & Horn 2007:72-74).

To address the underground threat, the participating mine started implementing special engineering projects to seal access “holings” to redundant underground mining operations with concrete. When possible, copper cable was recovered and removed from these redundant sites in collaboration with proto-teams as part of proactive operations (some of the redundant sites are no longer safe for employees to enter).

In addition to managing the risk of trespassers entering underground operations, the participating mine also continued to face difficult challenges to detect copper theft at the lower-risk mining operations as these areas have perimeter fencing of hundreds of kilometres to patrol.

To complicate matters, many suspects pose as employees and wear stolen company clothing to gain access to mining areas during large shift changes (which can involve up to 5,000 employees per shift). It was found that suspects can easily conceal up to 50 kilograms of stolen copper (as illustrated in Figure 3.11).

Figure 3.11: Photograph of suspect arrested posing as an employee at a mining operation



To address this security risk, the participating mine hosted various awareness events. Role-players such as the local police, state prosecutors and magistrates were invited to the mining operations for site and even underground visits to familiarise themselves with the unique environment and challenges faced by the mining industry. Awareness and safety campaigns were also held for employees to make them aware of the dangers posed by trespassers on mining operations. The importance of reporting strangers to

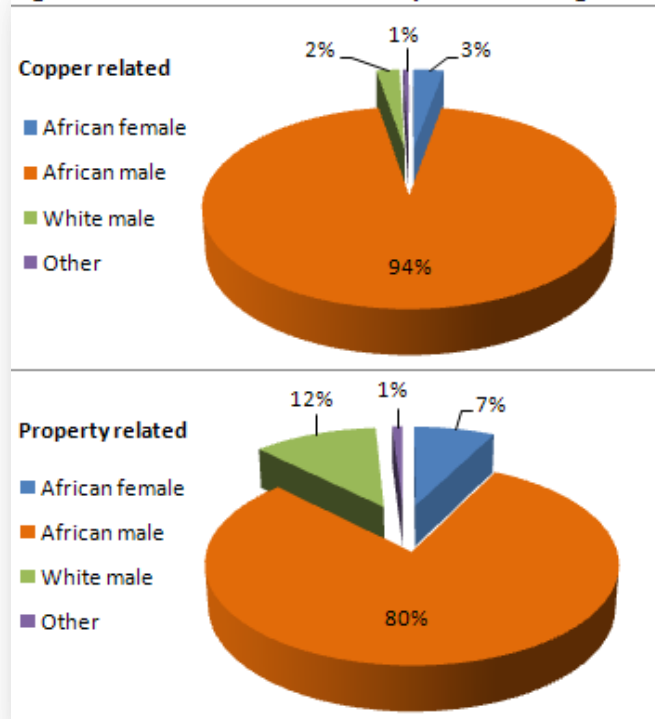
security personnel when identified was also highlighted. Participant 15 was of the opinion that there is only one way to successfully address copper-related theft: “[The] black market needs to be addressed with intelligence driven operations and the legislation available in terms of the Precious Metals Act, Second-hand Goods Act, Prevention of Organised Crime Act should be utilised to its full potential. In order to succeed, the criminal justice system, police and mining industry need to address the threat in a collaborative approach.”

According to Participant 11, despite all efforts, illegal access to underground operations and “theft underground of copper cable remain a major concern” and one of the greatest challenges the participating mine faces. It consequently continues to be classified as one of the top risks the security division focus on in terms of preventive strategies applied.

3.3.3 Offender profile

A total of 2,735 offenders were identified in the asset theft-related incidents recorded in

Figure 3.12: Identified offenders per race and gender

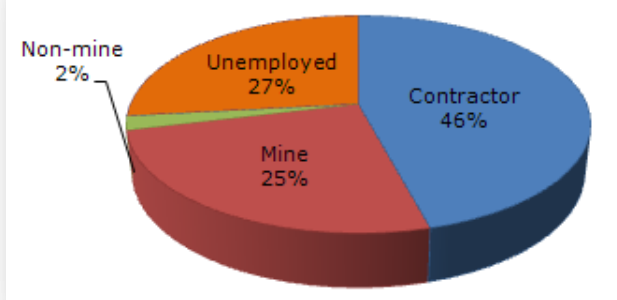


the period January 2006 to December 2010. Forty-three per cent (1,165) were arrested for copper-related thefts and 57% (1,570) for other property-related thefts. African males accounted for 94% of the identified offenders in copper-related incidents and 80% in property-related incidents (see Figure 3.12). With regard to the age of the offenders identified in the dataset, 31% were between the ages of 21 to 30 when the crimes were committed, 27% were between 31 and 40, and 22% were between 41 and 50 (see Annexure D, Table 6). More

than half of the identified offenders were African males between the ages of 21 and 40. According to the 1996 Census, Africans between the ages of 15 and 34 in South Africa comprised 78% of the total population (Braehmer et al 2000:1).

As illustrated in Figure 3.13, it was found that 27% of the identified offenders were

Figure 3.13: Employment type of identified offenders



unemployed trespassers on the mine. It was disconcerting to find, however, that 71% (1,946) of the identified offenders were granted access by the mine, either as permanent employees or employees of contracting companies. According to Participant 10, one of the most important factors contributing towards the efforts of the security

division in preventing crime is consistency in action taken against employees who are involved in crime.

In the dataset, nearly 60% of the identified offenders were found guilty in either a

Table 3.5: Outcome of case per employment type

| Outcome of case | Contractor | Mine | Non-mine | Unemployed |
|-----------------|------------|------|----------|------------|
| Not guilty | 50 | 83 | 8 | 36 |
| Pending | 70 | 65 | 8 | 118 |
| Recovery only | 12 | 15 | 0 | 33 |
| Resolved | 918 | 467 | 22 | 211 |
| Warrant | 160 | 33 | 9 | 177 |
| Withdrawn | 44 | 29 | 10 | 157 |

departmental disciplinary hearing and/or a criminal court hearing (see Table 3.5). Only 10% of the cases in the dataset were still pending at the time of

the analysis. Of the identified offenders that were found guilty, 57% were contractors, 29% were mine employees and 13% were unemployed trespassers on the mine. In 14% of cases a warrant of arrest was issued. It was further found that 47% of offenders with outstanding warrants of arrest were unemployed trespassers.

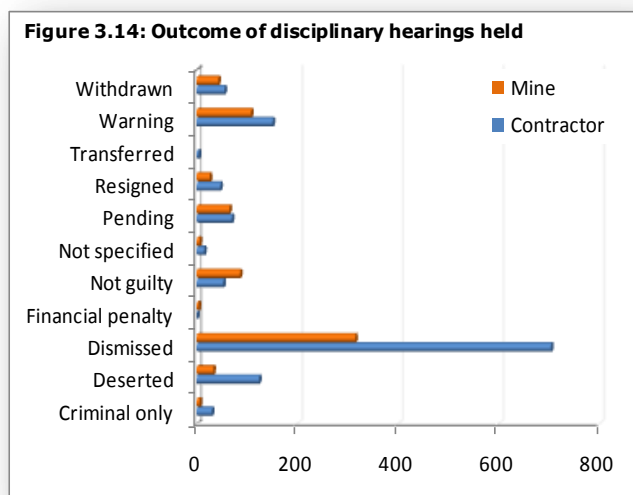
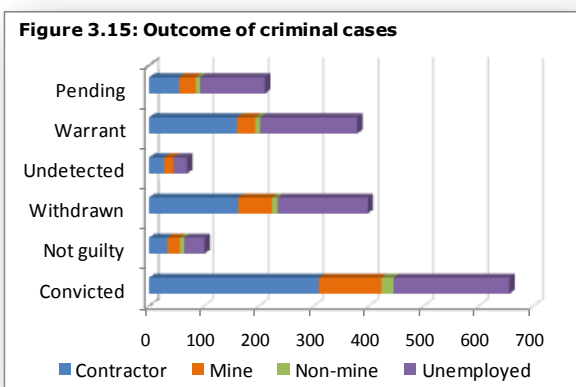


Figure 3.14 represents the outcome of departmental disciplinary hearings held for 1,946 offenders identified in asset theft employed by the mine when the crimes were committed. Employees whose employment was terminated included personnel that resigned before the hearings were finalised, deserted or were dismissed. They accounted for 81% of the identified offenders

that were employed by the mine either as permanent or contracted personnel and were found guilty during the internal hearing. The participating mine's strict policy against theft and "zero tolerance" towards crime was reflected in the outcome of disciplinary proceedings where offenders had been identified. Criminal action was taken against 1,814 of the 2,735 identified offenders (66%). Only departmental disciplinary action was taken against the other 921 identified offenders (34%) employed by the participating mine.

The outcome of the criminal cases is reflected in Figure 3.15. There were criminal investigations pending against 12% of the identified offenders at the time of the analysis.



In the 1,603 (88%) of criminal cases finalised, warrants for arrest were issued against 24% of the identified offenders after they failed to appear in court. An impressive 41% of the identified offenders were convicted, of which 65% were employed by the mine and 32% were unemployed trespassers. It is evident that the support the participating mine gives to the police and prosecutors through

internal investigations of asset theft cases yields exceptional results.

Table 3.6 reflects the sentences given to 656 offenders convicted for asset theft

| Sentence for convictions | Contractor | Mine | Non-mine | Unemployed |
|--------------------------|------------|------|----------|------------|
| Fine - R500 or less | 135 | 40 | 6 | 75 |
| Fine - R501 to R1,000 | 55 | 34 | 6 | 19 |
| Fine - R1,001 to R2,500 | 34 | 10 | 1 | 27 |
| Fine - R2,501 to R5,000 | 14 | 7 | 0 | 14 |
| Fine - R5,001 to R10,000 | 0 | 0 | 0 | 7 |
| Imprisonment | 15 | 3 | 2 | 12 |
| Deported | 0 | 0 | 0 | 4 |
| Correctional service | 1 | 1 | 0 | 0 |
| Suspended fine | 31 | 8 | 2 | 20 |
| Suspended prison | 13 | 7 | 5 | 16 |
| Warned and released | 7 | 4 | 0 | 7 |
| Not specified | 4 | 0 | 0 | 10 |

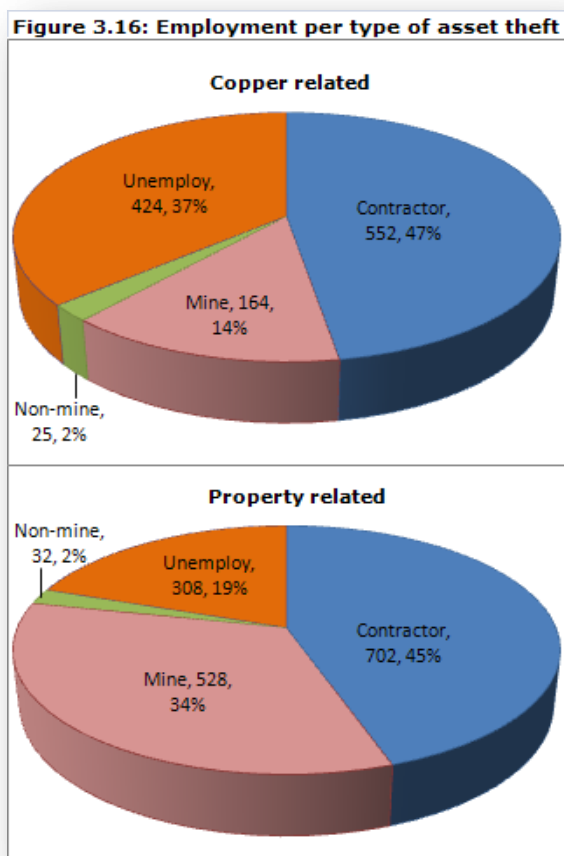
(including offenders who were allowed to pay admission of guilt fines). With a remarkable conviction rate of 41% it was disappointing to find that 39% of the convicted offenders – of which 29% were unemployed trespassers on the mine – paid a fine of R500 or less. A further 17% paid a fine of between

R500 and R1,000. Another 19% of the convicted offenders – of which 35% were unemployed trespassers – received suspended sentences or were released with a warning. Only 5% of the convicted offenders were effectively imprisoned.

South African courts in principle use a discretionary sentencing system (Terblanche & Roberts 2005:187-202). Within the boundaries set by the legislature, the courts have to employ judicial discretion to determine an appropriate sentence, based on a balancing of the facts of that particular case. As the trial court is generally involved in the trial from start to finish, it is considered the best placed to impose an appropriate sentence. This judicial discretion is coupled with a well-established system of appeal against sentences imposed in all the trial courts, as well as a judicial review of sentences imposed in the lowest courts. The state is further permitted, in terms of the Criminal Procedure Act, to appeal against a patently lenient sentence. The legislature has not only established a ceiling to the courts' sentences, but has also provided a floor in the form of minimum sentences applicable to certain crimes. This was amended in 1998 when the Criminal Law Amendment Act 19 was passed.

3.3.4 Offender modus operandi

In the dataset, of the 2,735 offenders identified, 43% (1,165) had been involved in



43% (1,165) had been involved in copper-related incidents and 57% (1,570) in other property-related incidents. The employment type of the identified offenders in these two categories shows the difference in the type of asset at risk from an outside threat (trespassers) and an internal threat (persons who have access to the mine through permanent employment or employment by contracting companies working on the mine). Of the identified offenders involved in copper-related incidents, 39% were unemployed or non-mine personnel compared to 21% involved in other property-related incidents (see Figure 3.16). Permanently employed mine workers comprised 14% of the identified offenders in copper-related incidents and 34% of other property-

related incidents. Employees of contracting companies comprise nearly half (46%) of the identified offenders in the dataset.

In terms of the employment type of identified offenders, a difference was also found

| Type of place | Contractor | Mine | Non-mine | Unemployed |
|----------------------------|------------|------|----------|------------|
| Off site | 36 | 28 | 3 | 43 |
| Hostel/residential village | 38 | 34 | 3 | 36 |
| Business premises/offices | 21 | 12 | 1 | 4 |
| Mining operation | 502 | 409 | 24 | 172 |
| Concentrator | 54 | 23 | 1 | 53 |
| Smelter | 38 | 13 | 0 | 0 |
| Refinery | 13 | 9 | 0 | 0 |

pertaining to the type of place or area where the incidents took place (see Table 3.7). Of the 111 offenders identified for property thefts that occurred at hostels or

residential villages (mine accommodation), 35% were trespassers. At the high-risk areas, namely the smelters and refineries, contractors comprised 70% of the identified offenders and permanently employed mine employees 30%. No trespassers were involved in any of the property thefts at the higher-risk areas. It was found that in property-related incidents that occurred at concentrators, 41% were trespassers while only 18% of the identified offenders at the lower-risk mining operations were trespassers. However, the fact that 54% of the property-related incidents that were closed as undetected occurred at the lower-risk mining operations (see Annexure D, table 7) could be explained by a failure to apprehend the trespassers.

Table 3.8 illustrates the place or area where copper-related incidents occurred and

| Type of place or area | Contractor | Mine | Non-mine | Unemployed |
|----------------------------|------------|------|----------|------------|
| Access gate | 50 | 11 | 1 | 7 |
| Cable racks | 3 | 3 | 0 | 15 |
| Cable yards | 22 | 5 | 0 | 54 |
| Change house | 2 | 2 | 0 | 0 |
| Concentrator | 4 | 0 | 0 | 7 |
| Hostel/residential village | 21 | 8 | 2 | 26 |
| Off site | 11 | 7 | 5 | 20 |
| Office/store /workshop | 4 | 4 | 0 | 7 |
| Pump/vent fan/sub-station | 10 | 0 | 2 | 45 |
| Salvage yard | 6 | 0 | 0 | 1 |
| Shaft | 358 | 99 | 11 | 135 |
| Smelter | 1 | 2 | 0 | 1 |
| Surface | 19 | 4 | 4 | 58 |
| Underground | 40 | 19 | 0 | 34 |
| Waste dump | 1 | 0 | 0 | 14 |

offenders were identified. Forty-three per cent of offenders identified for underground copper or cable theft were contractors, an alarming 37% were trespassers, and 20% were mine employees. Eighty-six per cent of offenders detected or caught at salvage yards were

contractors, while 73% of offenders detected at access control points or gates were contractors. Trespassers were mostly found in areas such as waste dumps, pump stations, sub-stations, ventilation fans, cable racks, cable yards and concentrators.

Where trespassers were apprehended, it was found that 75% were detected during suspect searches. A further 12% were detected with vehicle searches conducted by the security division of the participating mine (see Table 3.9). Thirty-five per cent of

Table 3.9: Detection method where offenders were identified

| Detection method | Contractor | Mine | Non-mine | Unemployed |
|-------------------------|------------|------|----------|------------|
| Alarm/camera | 5 | 1 | 0 | 10 |
| Concealed in bag | 156 | 126 | 7 | 4 |
| Housebreak | 13 | 10 | 4 | 40 |
| Off site/residence/SAPS | 24 | 17 | 3 | 30 |
| Reported to security | 22 | 34 | 3 | 4 |
| Robbery | 5 | 4 | 0 | 7 |
| Suspect search | 937 | 415 | 35 | 556 |
| Vehicle search | 92 | 85 | 12 | 78 |

offenders identified and caught during vehicle searches were contractors and 32% were mine employees. Where offenders attempted to conceal the stolen property or copper in bags

or containers they had with them and were identified during routine area patrols, 54% were contractors and 44% were mine employees. Sixty-three per cent of offenders caught after the security division responded to alarms or through surveillance cameras were trespassers and 31% were contractors. Of the incidents reported to the security division and where offenders were identified, 54% were mine employees and 35% were contractors.

The types of assets involved where offenders had been identified are given in Table 3.10.

Table 3.10: Type of asset involved where offenders were identified

| Type of asset | Contractor | Mine | Non-mine | Unemployed |
|-----------------------------------|------------|------|----------|------------|
| Equipment/tools | 321 | 271 | 4 | 64 |
| Building material/furniture | 22 | 14 | 4 | 36 |
| Paint | 67 | 35 | 2 | 5 |
| Petrol/diesel/oil | 26 | 20 | 5 | 9 |
| Safety equipment/medical supplies | 18 | 19 | | 9 |
| Computer/cellphone/camera/radio | 17 | 29 | 1 | 4 |
| Cash, clothing or consumables | 117 | 93 | 4 | 7 |
| Aluminium/corrugated iron/steel | 43 | 11 | 8 | 147 |
| Brass/solar panels | 18 | 6 | 1 | 3 |
| Cable - electrical/other | 34 | 12 | | 4 |
| Copper/cable | 552 | 164 | 25 | 424 |
| Other | 19 | 18 | 3 | 20 |

It was found that 57% of the trespassers identified had stolen copper or copper cable in their possession while another 20% of trespassers had stolen aluminium, corrugated iron or

steel. Other items stolen by trespassers included equipment or tools (9%) and building material or furniture (5%). It can be argued that trespassers mostly access mining premises illegally to steal non-ferrous metals and that other property is taken should the opportunity arise.

Contractors identified in property-related incidents mostly stole equipment or tools (46%). The same pattern was found where employees were identified (52%). Where laptops, computers, computer parts, cameras, radios or cell phones were stolen, the identified offenders were mostly employees (57%) or contractors (33%), whereas cash,

clothing and consumables were most often stolen by contractors (53%) or employees (42%).

In the dataset, where offenders had been identified and the value per incident exceeded

| Value per incident | Contractor | Mine | Non-mine | Unemployed |
|-----------------------|------------|------|----------|------------|
| R0 - R500 | 828 | 468 | 21 | 168 |
| R501 - R1,000 | 167 | 64 | 8 | 96 |
| R1,001 - R2,500 | 104 | 50 | 6 | 128 |
| R2,501 - R5,000 | 61 | 40 | 9 | 78 |
| R5,001 - R10,000 | 30 | 19 | 1 | 81 |
| R10,001 - R25,000 | 47 | 27 | 6 | 95 |
| R25,001 - R50,000 | 12 | 7 | 4 | 31 |
| R50,001 - R100,000 | 1 | 9 | 1 | 40 |
| R100,001 - R250,000 | 2 | 7 | 0 | 12 |
| R250,001 - R500,000 | 1 | 0 | 1 | 2 |
| R500,001 - R1,000,000 | 1 | 1 | 0 | 1 |

R10,000, it was found that 63% of the offenders were trespassers, 21% were contractors and 16% were employees (see Table 3.11). However, it was found that among the trespassers identified, 77% of the

assets involved per incident had a value of less than R10,000 while 23% had a value of more than R10,000. As mentioned above, five incidences resulted in the participating mine experiencing downtime because of cable theft. Four suspects involved in these incidences were apprehended and it was established that they were all trespassers. It is therefore evident that the mine can suffer big losses through small numbers of trespassers gaining access to mining operations.

It is obvious from the analysed dataset that although the crime prevention strategy implemented at the participating mine had positive results and various successes, the mining company has to contend with a significant challenge to its assets and employees from the criminal threat faced by the country in general.

3.4 SUMMARY

This chapter primarily focused on an analysis of asset theft-related incidents (excluding prime product) recorded by the participating mine for the period 1 January 2006 to 31 December 2010. The analysis of this dataset gave rise to some issues to consider when formulating a preventive strategy designed to curb asset theft at the participating mine. The most significant findings are summarised below.

It was found that in the five-year period copper-related thefts remained an immense challenge for the participating mine and comprised nearly half (2,933 incidents) of the total asset thefts (6,045 incidents) recorded at the mine.

- More than 70% of the copper-related incidents were detected by the security division of the mine through, among others, suspect searches (26%); vehicle

searches (3%); searches conducted in collaboration with the police at the residences or business premises of identified suspects (1%); recoveries made during routine patrols (40%); or responses to alarms or camera surveillance (2%).

- Most of the copper-related incidents occurred at the lower risk mining operations: at the shafts (49%); pump stations or sub-stations (11%); cable racks (6%), cable yards (6%); and waste dumps (4%). A further 5% occurred underground. Only 1% of the incidents occurred at the high-risk smelters and less than a half per cent of the incidents occurred at the highest-risk areas, namely the refineries.

In the other property theft-related incidents dataset, it was found that more than half (58%) of the incidences involved items that are easily disposed of and a further 17% involved items that the offenders could use themselves.

- The most significant assets at risk found in this dataset included equipment or tools (36%); aluminium, corrugated iron or steel (9%); laptops, computers or computer parts (9%); and cell phones (7%).

Despite the complex challenges, it was found that the participating mine has a fairly good “guilty” rate of 20% in copper-related incidents and 28% in other property-related incidents. Only 30% of the finalised incidents were closed as undetected without recovery. A notable 60% of the finalised incidents were closed successfully, with either a guilty finding and/or a recovery made.

A total of 2,735 offenders were identified in asset theft-related incidents recorded in the period under review, of which 43% (1,165) were arrested for copper-related thefts and 57% (1,570) for other property-related thefts.

- Twenty-seven per cent of the identified offenders were unemployed trespassers on the mine.
- Seventy-one per cent of the identified offenders had legal access to the mine, either as permanent employees or employees of contracting companies.
- Employees of contracting companies comprised nearly half (46%) of all the identified offenders in the dataset.
- Where offenders were identified for underground copper or cable thefts, 43% were contractors, 37% were trespassers and 20% were mine employees.
- Where trespassers were caught, 75% were detected with suspect searches and a further 12% were detected with vehicle searches conducted by the security division.

- Fifty-seven per cent of the trespassers identified stole copper or copper cable and a further 20% stole aluminium, corrugated iron or steel.
- Nearly 60% of the identified offenders were found guilty at either a departmental disciplinary hearing and/or a criminal court hearing.
- Eighty-one per cent of the identified offenders employed by the mine either as permanent or contracted personnel who were found guilty during internal disciplinary hearings had their employment terminated.

Of the 1,603 criminal cases finalised, warrants for arrest were issued against 24% of the identified offenders after they had failed to appear in court. A notable 41% (656) of the identified offenders were convicted of which 65% were employed by the mine and 32% were trespassers. The sentences imposed on these offenders included the following:

- Thirty-nine percent of the convicted offenders, of which 29% were trespassers on the mine, paid a fine of R500 or less.
- Seventeen per cent paid a fine of between R500 and R1,000.
- Nineteen per cent, of which 35% were trespassers on the mine, received a suspended sentence or were only warned and released.
- Five per cent of the convicted offenders were effectively imprisoned.

Despite the security measures implemented, the participating mine still faces a considerable challenge in order to address asset theft. Chapter 4 gives an overview of crime prevention approaches that could be considered for a holistic and integrated crime prevention strategy at the participating mine in order to address asset theft.

Chapter 4

Discussion on crime prevention strategies

“However beautiful the strategy, you should occasionally look at the results.” (Sir Winston Churchill, British politician 1874-1965)

4.1 INTRODUCTION

The complex nature of crime prevention models derives from the complicated nature and character of the crime phenomenon itself. The notion of crime may seem uncontested and obvious, but it applies to a range of different behaviours that vary according to method, place and time, and may have different causes and consequences. It is therefore a complex and moving target, on a complex and shifting landscape (Frank 2006:1).

Chapter 2 reflected on some of the factors that could contribute towards crime at the participating mine while Chapter 3 offered a more in-depth discussion of the nature and extent of asset theft at the mine. This chapter will focus on a review of some of the crime prevention strategies and approaches that can be used in the South African mining industry, and in particular at the participating mining company.

For the purpose of this case study “crime prevention” (the proactive approach) will be considered to include all three focus areas of crime reduction defined by the South African Government, namely altering the environment in which crime occurs (situational); changing the conditions which are considered to cause crime (social); and using an effective criminal justice system as a strong deterrent against crime (law enforcement).

Crime prevention is a complex and extensive research field and it should be reiterated that this chapter is not intended to serve as an all-inclusive review of all the crime prevention strategies, approaches and models available. It features a discussion of some of the crime prevention models identified during the literature review that are practicable at the participating mine. These models are regarded as proactive approaches that could be considered in formulating a holistic and integrated crime prevention strategy to address asset theft at the participating mining company in particular. The main focus of this chapter will consequently be the integrated relationship between the different crime prevention approaches and crime prevention models applicable to the South African

mining industry, and the participating mine in particular, seen in the context of factors and trends identified in the previous chapters.

4.2 OVERVIEW OF CRIME PREVENTION MODELS

When the crime phenomenon is examined in its full complexity, crime prevention models can address prevention at a general level, including programmes focused on the more vulnerable contexts by reducing the attractiveness of crime or the generators of crime; or address the immediate needs of existing crime problems by reducing reoccurrence (Brantingham, Brantingham & Taylor 2005:273). There are three categories of crime prevention approaches, namely “primary, secondary and tertiary” approaches.

The definition, orientation and strategic objectives of the different crime prevention models are however inherently and intractably political in nature (White & Haines 1996:111). It is important to acknowledge that there are competing perspectives, namely “conservative, liberal and radical”, and consequently diverse forms of intervention (some of which are mutually exclusive, others that reinforce each other). It is therefore important to expose the vested interests behind specific approaches to crime prevention.

Primary crime prevention focuses on reducing crime by addressing underlying factors that have a basic influence on people, sites and situations that are amenable to criminal events. This approach is directed towards physical, socio-psychological and economic conditions that promote crime in general (Brantingham et al 2005:274).

“Conservative crime prevention” is based on the premise that crime control is the basic issue at stake. It is founded upon the notion that the key issue is adherence to the law and that law enforcement and crime prevention should therefore be focused on addressing potential and current violations of the law. Crime is consequently mostly seen as a matter of incentives and deterrents. Basically, this approach combines the elements of the classical criminological theory (with an emphasis on voluntarism and personal responsibility) with the rational choice theory (which sees human behaviour primarily in terms of calculated assessments of the costs and benefits of particular courses of action). The solution to crime would therefore be to increase the costs and reduce the opportunities for the commission of crime and to increase the likelihood of detection (White & Haines 1996:101-102).

Secondary crime prevention focuses more specifically on individuals, groups, social conditions or physical settings known to be at high-risk of becoming involved in criminal events. Secondary prevention includes education programmes specifically designed for

groups at-risk, for example children of parents with criminal records (Brantingham et al 2005:274).

“Liberal crime prevention” is based on the views that crime is in general a social problem linked to particular individual deficits and group disadvantages. It is founded upon the notion that people rather than crime control should be the starting point for change and that reform is needed at the level of the individual and collective circumstance. Basically, this perspective views the issue as one of opportunity enhancement for those people who have been in some way dissociated from adequate or appropriate work and school opportunities. The main focus in this perspective is therefore on "at-risk" individuals and groups who display some sign of propensity to engage in conventional crime. This approach is based on some of the elements from theories such as biological and psychological explanations (generally oriented towards a range of attributes of the individual), the strain theory (with an emphasis on the disjuncture between the cultural goals and structural means to attain these), the labelling theory (where positive self-esteem is linked to personal resources and the nature of state intervention), as well as some forms of the later left realism theories (which emphasise on multi-agency approaches at a local level). The difference between the criminal and the non-criminal is considered to be dictated by biological, psychological and social circumstances (White & Haines 1996:102-104).

Tertiary crime prevention is directed towards the prevention of criminal event recurrence. Tertiary prevention includes physical modification of repeatedly victimised buildings, offender rehabilitation programmes, restorative justice, site-specific law enforcement, and hotspot deterrence programmes (Brantingham et al 2005:274).

“Radical crime prevention” considers law and order as an arena of political struggle. Crime and criminality is considered to be historically and socially constructed, and is best understood as reflecting structural social divisions and inequalities. This theory is most closely associated with the Marxist criminological theory (which perceives class analysis as central to an understanding of crime under capitalism), the feminist criminological theory (with gender relations and power differentials as the major focus), and critical criminology (referring to perspectives that examine the oppression and marginalisation of groups on the basis of class, gender, ethnicity, sexuality and race). The key concept of this approach is that of fundamental social change, which should be directed at enhancing the material well-being, social rights and decision-making power of the majority in a society. The biggest crime is seen to be that of economic inequality and social and economic marginalisation or discrimination. Instead of focusing on aspects of crime control, or individual or group adjustment to existing structural conditions, this

approach challenges the basis of marginalisation, social alienation and market-driven competition (White & Haines 1996:104-106).

For the purpose of this case study, the crime prevention models discussed in this chapter include situational crime prevention, social crime prevention, and crime prevention through law enforcement. In formulating a holistic and integrated crime prevention strategy that could be considered to address asset theft at the participating mining company in particular, these crime prevention models will be discussed in the context of all three crime prevention approaches (primary, secondary and tertiary).

| | Primary/conservative | Secondary/liberal | Tertiary/radical |
|------------------------|---|---|---|
| Situational | Target hardening, surveillance, opportunity reduction or removal, environmental design and general deterrence | Target hardening and design measures based on risk predication, vulnerability assessments and deterrence models | Individual deterrence, incapacitation, assessment of "dangerousness" and risk. Directed towards prevention of recurrence, for example hotspot deterrence programmes |
| Social | Education and socialisation, public aw areness and advertising campaigns | Working w ith those at higher risk of offending: poor, youth, unemployed etc | Rehabilitation, confronting offending behaviour, diversion, as w ell as community regeneration |
| Law enforcement | Targeted visible policing and security at crime hotspots | Establishing community policing forums to create aw areness in "at-risk" communities | Site-specific law enforcement initiatives, for example the training of response units for CCTV systems in high-risk areas |

Table 4.1 illustrates how selected crime prevention models are integrated into the crime prevention approaches discussed in this chapter.

4.2.1 The situational crime prevention model

According to Participant 15, "at our mining sites and processing plants, situational crime prevention measures and methods are mainly used". In response to the question "What do you think is the best and most effective way to deal with causative factors or general factors contributing towards crime in the mining industry?" all the participants held the opinion that increased physical security measures and controls contribute towards an effective crime prevention strategy.

Situational crime prevention (SCP) distinctly varies in its theoretical orientation from the mainstream criminological approaches, as SCP has a noticeable practical focus on ways to reduce crime. It was initially developed as a concept in the 1980s by Ronald Clarke (Clarke 1980:136-147). Situational prevention and its table of strategies and techniques continued to evolve on the basis of new research findings and through the exchange of ideas with other criminologists (Brantingham et al 2005:275).

The private sector tends to seek for measures that could immediately deliver the results and look for ways and means capable of visibly discouraging criminals' movements. The emergence of closed-circuit television (CCTV), electronic alarms, swipe cards, computer chips for identification, passwords, screening devices, secured parking systems and hidden cameras is the product of the growing concern to respond to the crime problem promptly. The focal point of SCP is therefore on the setting and context of crime rather than on criminals. It makes the criminal action difficult by constructing the target inaccessible through several techniques based on the manipulation of environment and applications of technology. SCP is applied on the assumption that crime reduction is possible if the opportunities for crime are significantly reduced. This objective can be achieved by making the target less accessible and less vulnerable ('target hardening'), by increasing natural and techno-surveillance, or by making criminal activity more risky and benefits less rewarding (Bajpai 2004:5).

During a study conducted by the Institute for Security Studies (ISS) in the South African mining industry, participants' opinions and attitudes regarding crime prevention methods were tested. Coetzee and Horn (2007:53-55) found in the dataset that the following perceptions were recognised regarding the effectiveness of security measures implemented to prevent theft from mine premises:

- Seventy-three per cent of the participants replied that random security searches were successful.
- Seventy-nine per cent of the participants thought that security access control was successful.
- Seventy-eight per cent of the participants believed that surveillance cameras were successful.

With regard to situational crime prevention measures considered to be effective at the participating mine, most of the participants cited effective surveillance, effective access control, effective perimeter fencing and security patrols.

Participant 1 commented on SCP at the participating mine as the use of "strengthened barriers and access control" in order to "create distance between criminal intent and loot". According to Participant 12, it is important to "remove opportunity" with target hardening that includes electrical fencing, increase in searches of people and vehicles at shafts and gates, and an increase in security patrols and surveillance cameras in high-risk areas.

As discussed in Chapter 3, it was found in the dataset that during the five years under review more than 70% of the copper-related incidents recorded at the participating mine were detected by the security division with either suspect searches (26%), vehicle

searches (3%), or searches conducted in collaboration with the police at the residences or business premises of identified suspects (1%). A further 40% of the incidents were recoveries made during routine patrols or responses to alarms or camera surveillance (2%), as reflected in Figure 3.10. It was found that security searches or patrols comprised nearly 60% of the detection method of all other property-related incidents as well (see Figure 3.8).

Cornish and Clarke (2003:90) presented the situational crime prevention model by describing five strategic phases that have to be considered when situational preventative strategies are formulated:

- *Techniques that increase the effort required to commit a crime:* The theories on which situational prevention approaches are grounded assume that most crime, particularly property crime, is committed because it is easy to do. Interventions that increase the effort needed to commit a crime will therefore deflect many potential offenders. Effort can be increased by target hardening, access control, screening exits, and controlling tools or weapons.
- *Techniques that increase the risks of committing a crime:* Most intervention techniques that focus on increasing the risks of criminal activity begin as secondary or tertiary approaches, but can be broadened into primary-level approaches. For example, risks can be increased by extending guardianship, that is, by situating people to be watchers (security personnel for instance). An increase in the risks or perceived risks of offending could also come from natural surveillance or artificial surveillance such as CCTV.
- *Techniques that reduce the reward derived from crime:* Reducing rewards is a category closely linked to effort and risks. For object-oriented (property or asset) crimes, effort is tied to a high perceived likelihood of success. When potential targets are less visible and are of unknown quantity before a crime is initiated, the crime has less value. Intervention techniques range from concealing or removing property from areas potential offenders might frequent to making them unusable if stolen; from disruption of illegal markets to denying benefits.
- *Techniques that reduce provocation:* Understanding the immediate triggers for criminal events is another important component of situational crime prevention analysis. This component includes techniques that reduce the provocative elements in situations below trigger thresholds and thereby prevent crimes from

happening. These techniques include the reduction of stress and frustration, emotional arousal, and peer pressure.

- *Techniques that remove excuses for doing crime:* Removing excuses is an intricate component of situational prevention common to many crime prevention programmes. It can include, for example, security and safety information boards, roadside speed displays, and visitor registration. This set of techniques makes it difficult for a person to use “but I didn’t know” or “but I couldn’t find” as an excuse for criminal behaviour. Removing excuses also includes making it especially easy to comply with laws and regulations so that the law-compliant action is also the least-effort action.

Although situational prevention is probable at the primary, secondary, and tertiary levels, it considers crime within a crime analysis framework where criminal incidences are analysed in context and are considered to be the results of a sequence of decisions (some routine, some more conscious) and are therefore considered to be the underlying key component in embedded crime prevention (Brantingham et al 2005:275).

SCP is normally regarded as a crime control method that does not rely on “improving society” but rather on reducing the opportunities for crime to occur, usually through changes in the physical environment. By intensifying the effort required to commit a crime, increasing the likelihood of detection, or reducing the rewards associated with offending, situational crime prevention aims to modify an offender's cost-benefit analysis to make the crime seem not worth committing (Barnes 1995:95-96).

Twenty-five techniques were developed by Clarke and Eck (2003:33-34) in response to changes in how to understand crime, theories on reducing crime, and the changes in crime itself. These techniques were tabulated into the five strategic phases of situational crime prevention models (see Table 4.2).

| Table 4.2: Clarke and Eck's 25 techniques table | | | | |
|--|---|---|---|-------------------------------------|
| Increase the effort | Increase the risks | Reduce the rewards | Reduce provocation | Remove the excuses |
| Harden targets (perimeters/buildings) | Extend guardianship (improve communications) | Conceal targets (reflective film, blinds) | Reduce frustration (staff training) | Set rules (clear agreements/policy) |
| Control access (gates/entry points) | Assist natural surveillance (control growth and improve lighting) | Remove targets (secure stock) | Avoid disputes (reduce crowding) | Post instructions (signs) |
| Screen exits (electronic tags) | Reduce anonymity (staff/visitors IDs) | Identify property (marking) | Reduce emotional arousal (controls on sexual and violent imagery) | Alert conscience (signs) |
| Deflect offenders (secure access roads) | Utilise place managers (w histleblowers) | Disrupt markets (identify stock and assets) | Neutralise peer pressure (prosecute) | Assist compliance |
| Control tools (gear) | Strengthen format surveillance (guards, CCTV) | Deny benefits (PIN codes) | Discourage imitation (repair) | Control drugs and alcohol |

From Clarke and Eck (2003:33).

Most participants pointed out that continuous audits and assessments of physical security measures implemented at mining sites and processing plants were important to ensure the most effective crime prevention strategies were in place. The importance of conducting risk assessments was stressed by most of the participants, who also referred to the importance of a proper cost-to-cost and return-on-investment assessment.

Participant 15 indicated that a risk assessment should identify the most common modus operandi of offenders, crime hotspots, and the type of asset that is at-risk and added that "it is important to have a proper risk assessment prior to the implementation or upgrade of security measures. It also contributes to an evaluation of what security measures are effective." Participant 2 considered the process of effective risk management strategy to include the identification of the assets, risks, weaknesses, vulnerabilities, threats and to "identify countermeasures, implement, test and manage". Participant 13 stressed that it is important to "build your strategy around the five pillars of security: technical equipment, surveillance, crime combating, investigation and intelligence strategy".

In addition to the approach of dealing with crime by only implementing visually affronting security or target-hardening measures such as locks, physical barriers, security gates and security patrols based on SCP strategies, crime prevention through environmental design (CPTED) promotes high-quality and visually agreeable solutions as first responses to crime with the aim of improving the legitimate use of space that can be applied in context to further target hardening (Fok, Ting, Jin, Man, Kei & Chyi 2004:3).

As part of the "situational" prevention model illustrated in Table 4.1 which is discussed for the purpose of this case study, the CPTED principles will be explored further to

elaborate on methods that can be used in context to the situational crime prevention strategies that can be applicable to the participating mine.

4.2.2 The crime prevention through environmental design model

The claim that property crime can be prevented through manipulating the design of individual dwellings and their relationship to one another and to the surrounding neighbourhoods is called crime prevention through environmental design (CPTED) (Geason & Wilson 1989:2).

CPTED is a concept that has been researched extensively for decades and many researchers from countries across the world contributed towards the understanding and development of the methodologies. They include Jeffery (1971), Brantingham (1981), Plaster and Carter (1993), Crowe (2000) and Parnaby (2006) to mention a few. Although CPTED is not a new concept, South Africa only started to make use of CPTED in the late 1990s and is therefore fairly new to the concept. South Africa joined the international arena by introducing CPTED principles as part of its National Crime Prevention Strategy. Being a relative latecomer to the field can be considered to be an advantage, however, as the country can now apply the best of all the research findings and does not need to work through thirty years of trial and error as other countries had to do (Coetzer 2003:204).

The four key principles of CPTED are as follows (Fok et al 2003:3-5):

- *Natural surveillance*: can be achieved by a number of techniques such as windows, lighting, and the removal of obstructions to improve sight lines from within buildings. The fundamental hypothesis is that criminals do not wish to be observed. Surveillance therefore increases the perceived risk to offenders. This may increase the actual risk to offenders if those observing are willing and capable to act when potentially threatening situations arise. The primary aim of surveillance is therefore not to keep intruders out (although it may have that effect) but rather to keep intruders under observation.
- *Natural access control*: relies on doors, fences, shrubs, and other physical elements to keep unauthorised persons out. In its most elementary form, access control can be accomplished in individual dwellings or commercial establishments by using adequate locks, doors and window barriers.
- *Territorial reinforcement*: can be seen to work when a space, by its clear legibility, transparency and directness, discourages potential offenders because of owners' familiarity with each other and the surroundings. People instinctively protect a

territory that they feel is their own. Clear boundaries established between public and private areas by using physical elements such as fences, pavement treatment, art, signs, good maintenance and landscaping are ways to express ownership. Identifying intruders is also much easier in such well-defined spaces.

- *Maintenance and management*: are related to the area's sense of 'pride of place' and consequential territorial reinforcement. The more decrepit an area is, the more likely it is to attract unwanted activities. The maintenance and the 'image' of an area can have a primary impact on whether it will be targeted.

During interviews conducted at the participating mine, it became evident that although not practical or implemented at all the mining sites and processing plants, some of the security managers use CPTED principles to enhance their current prevention strategies. Participant 4 relies extensively on the remoteness of the mining site to prevent and control asset theft in the area, as the mining site "is situated in a remote and primitive area where businesses like scrap yards and pawn shops for example are not available. This is an advantage for me in terms of theft of copper and the like ... People in the area know each other [and] strangers are easy to identify." Participant 4 started a "natural surveillance" initiative whereby the traditional authorities were encouraged to "keep record of every citizen of each village and to any new developments in terms of business" and to inform the security members of the mine if any strangers are noticed in the area. This "intelligence initiative turns out to function very well."

Participant 12 specifically makes use of the surrounding environment as part of the preventive strategy. The surrounding high hillocks are used for observation, which the participant acknowledges is good "for and against us" as criminals may also use the advantage. Furthermore, a thick aloe plantation forms part of the perimeter and is quite effective to prevent access. The rivers in the area also contribute making "the area smaller to patrol and concentrate on".

Research conducted by the Council for Scientific and Industrial Research (CSIR) in South Africa's major cities shows that different types of environments contribute to the occurrence of different types of crime (Landman & Liebermann 2005:21). CPTED presents a clear opportunity for municipalities to respond to the needs of their constituencies in terms of the high crime rate. CPTED addresses the link between crime and place diametrically and aims to reduce the causes of and opportunities for criminal events by applying sound planning, design and management principles to the built environment. Internationally, CPTED embraces approaches as diverse as those favouring mixed land uses and an integrated approach to urban development to those that separate and exclude through an over-emphasis on target hardening (ibid:22).

According to Participant 9, CPTED plays a crucial role when a new mine structure is being built and stated "with security involved, it is easier to integrate security measures whilst the structure is being built to avoid the pitfalls of introducing security measures at a later stage with considerable costs".

Participant 10 was of the opinion that a proper assessment of the natural surroundings should form part of every risk assessment where "high-tech" security technology is implemented as part of the crime prevention strategy for those sites. The participant stressed the point with the following example: "In some cases high-tech security systems or fences are installed. Alarms are installed around the operations to prevent criminals from entering the sites. Movement detectors and electrical fences get installed between fences, but the drain water systems are unprotected giving the criminal element direct access to the site", which circumvents all the high priced physical measures implemented.

Crime reduction through product design (CRPD) was described by the Australian Institute of Criminology in a report which highlighted a number of ways in which technology is increasingly being used to reduce or prevent crime. CRPD involves integrating protective features and security measures into products in order to reduce their potential to become targets of criminal activity, as well as preventing their use as instruments of crime (Lester 2001:13). In this regard, the term "product" encompasses any physical property and forms of currency, as well as electronic information and computer software.

Examples of CRPD are:

- Deterring theft:
 - Electronic or ink tags on retail merchandise
 - Motor vehicle alarms or engine immobilisers
 - Notebook or laptop computer tracking devices
 - "Smart guns" using biometric technology to identify authorised users

- Limiting fraud, counterfeiting and copyright infringement:
 - Use of holographic images (for example on credit cards, vehicle parts and computer software)
 - Use of digital watermarking to protect electronic data
 - Use of micro-printing or water marking personal cheques
 - Development of polymer bank notes

Another example of the application of CRDP in the mining industry is a product from Holomatrix presented at the 2007 National Combating Non-ferrous Metal Theft Conference, namely a "micro-dot" solution for the non-ferrous metal environment. The "veri-dot" product is made of nickel which can withstand temperatures as high as 1 455

degrees Celsius. It is available from 150 microns to 1 millimetre in size. These “veri-dots” are embedded with full holographic images to provide unique identification (Peterson 2007:10-16).

At the participating mine, various state-of-the-art security technology aids are used to protect high-risk areas, especially at the processing plants. According to Participant 5 “No system and/or procedure is successful on its own. The most successful usually is a combination of effective systems, strictly applied procedures and professional and dedicated human intervention.” Security technology used at the participating mine includes the following:

- Biometric access control units
- X-ray machines and body scanners at high-risk exits
- Surveillance cameras with a centralised surveillance control unit
- Double perimeter fences with large clearance areas
- Electrical internal perimeter fences equipped with alarms
- Double airlock gate system with delivery vehicles

The participating mine makes use of not only SCP principles, but also incorporate CPTED principles utilising the surrounding natural areas as part of the security strategy, as well as CRDP principles pertaining to the use of security technology and to ensure effective implementation, maintenance and continuous monitoring. The mine also uses statistical data relating to crime trends and offender profiles in conjunction with police crime statistics of proximal areas to assist the mining sites with their physical crime prevention strategies. In addition, on an annual basis each of the mining sites and processing plants are reviewed by an internal security audit team to evaluate if the physical security measures implemented are effective and up to standard in terms of the company’s risk reduction and safety policies.

As part of the crime prevention strategy of the participating mine, discussed in context with Table 4.1, the situational crime prevention model is utilised with a primary approach, including target hardening, surveillance, risk reduction, environmental design, and the use of security technology. As a secondary approach, the participating mine makes use of risk and vulnerability assessments as part of the situational crime prevention model, and with a tertiary approach focussing on the identification and addressing of hotspots and weaknesses with the use of integrated security audits to prevent recurrence.

Since 71% of the identified offenders had legal access to the participating mine (see Figure 3.13), crime prevention measures directed only towards prohibiting prospecting offenders access to the mining operations with target hardening – such as perimeter fences, area patrols and access control – will not be effective in itself to address asset theft. Many of the participants considered the low socio-economic factors, especially pertaining to informal settlements situated close to the mining operations, to be contributing towards crime at the participating mine. Nearly half of the participants held the opinion that uplifting poverty in communities situated close to the mining operations will reduce crime. Participant 10 stated that: “If government and mining houses in the area cannot manage to sort poverty out, then the fight against crime will never be won.”

According to Frank (2003:21) crime prevention requires engagement with questions relating not only to the perpetual prevention, but also with regard to how social justice, human rights, and democracy contribute to this effort, as it could be argued that many crimes may be practical responses to challenging social, economic and cultural conditions.

In formulating a holistic crime prevention approach at the participating mine, the conditions that may contribute to crime will consequently require some consideration as well.

4.2.3 The social crime prevention model

Social crime prevention can be described as an action to prevent crime and violence and to reduce public fear of crime. It is a tool to bring together different role-players involved in crime prevention and a means of developing local crime prevention partnerships. It can be regarded as a method to ensure coordination and management of crime prevention initiatives and an effective way to identify priority areas and tasks (Nel, Liebermann, Landman, Louw & Robertshaw 2000:1).

The International Centre for the Prevention of Crime defined social crime prevention as anything that reduces delinquency, violence, and insecurity by successfully tackling the scientifically identified causal factors of crime. By definition, social crime prevention is a multi-disciplinary approach which requires the collaboration of a range of sectors, including health, housing, education, and civil society groups. It is sharply differentiated from the state-centred approaches to crime reduction which has traditionally shaped criminal justice systems. Correspondingly, the 1998 White Paper on Safety and Security of the South African Government stated that social crime prevention aims to reduce the social, economic and environmental factors contributing to particular types of crime (Palmary 2001:3-4).

Pelser and Louw (2002:3) suggested that the concepts of safety and crime prevention should rather be considered to be 'social health' issues. This perspective allows the crime prevention burden to be shared and addressed across a range of role-players in government and civil society. Such a focus will also create political space for the longer-term interventions that, ultimately, are most important in ensuring the prevention of criminal behaviour.

There is a significant body of research on the role the media plays in influencing and affecting public perceptions and awareness about crime (Barak 1999:480-482). While the public largely depend on media such as newspapers and television to provide them with information about crime and the criminal justice system, the information they receive can be pretentious because of the limited sources used by journalists to create news stories. In fact, sensationalist reporting of violent crime by the media can often contribute to increased feelings of insecurity among the public and, in turn, may affect their overall quality of life. The media can therefore be used as a tool to play a significant role in social crime prevention strategies.

Early intervention that is aimed at reducing risk factors and enhancing protective factors that impact on the likelihood that a young person will engage in offending behaviour as a crime prevention strategy has proved very successful (Homel 2005:71). This social prevention strategy is based on the principle that intervening early in a young person's development can construct significant long-term personal, social and economic benefits. There is increasing evidence that early intervention is a more cost-effective strategy than more conventional approaches to prevention strategies aimed at reducing crime.

According to Govender (2001:3) from a social sciences perspective, it is important to understand that specific characteristics of society or of communities influence both the occurrence and the spatial distribution of crime. These characteristics include aspects such as existing policies, demographics, economics, and the current criminal justice system, institutions and structures. Some of the more commonly accepted causal factors of crime in South Africa are the moral breakdown of family structures, rapid urbanisation, relative deprivation, an inadequate criminal justice system and political instability. In addition the poor socio-economic status, high unemployment, a continued increase in the loss of jobs and an associated increase in poverty are considered to be some of the reasons for the high crime levels in South Africa.

The participating mine considers its social responsibility to the surrounding communities in a serious light and integrated social upliftment programmes into their crime prevention strategy. Participant 15 stated that "as part of the mining company's social responsibility, the socio-economic conditions in the

communities close to the mining operations” are focused on in particular as “many of the mining areas are surrounded by residential areas that experience poverty. By addressing these factors in the communities with social programmes, could result in a positive effect on crime reduction.” Participant 11 makes use of “self-help employment programmes” that are facilitated in the communities surrounding the mining operations which includes “skills training programmes” for community members hosted at mine training facilities encompassing community involvement and employee co-operation”. Participant 4 facilitates a community education and positive “interpersonal peer drive programme” with entertainment facilities for the youth in the neighbouring community. Participant 4 stated that “statistics proved beyond doubt that crime in SA is caused by youth” and believes that programmes “focused on youth will reduce crime. The increase in sports facilities creation in all sports code will psychologically have a positive impact in the behavioural change of our youth”. Participant 7 explained that “the establishment of an integrated coordinated comprehensive approach which draws on the resources of the business as well as civil society (trade unions)” has worked well thus far. Participant 7 holds the opinion that by “promoting a shared vision and common understanding of how are we going to tackle crime issues, developing a set of programmes which serves to kick-start and focus on the efforts of the Protection Services in delivering quality service at solving the problems leading to a high incidence of crime” is effective when “maximising the involvement of trade unions in mobilising and sustaining crime initiatives and by creating a dedicated and integrated crime fighting capacity within the boundaries of a business unit”. The security division of the participating mine work closely with other departments in order to utilise social responsibility initiatives as part of their crime reduction initiatives, which is a very effective approach if there are limited resources available within security divisions.

During the ISS study into the local mining industry referred to above, participants’ opinions and attitudes were also tested about the importance of the various role-players regarding the prevention, reporting and investigation of precious metals theft and theft of mine equipment and property. It was found that only 54% of participating mineworkers thought they played an important role in the reporting of theft from mine premises. They stated they would report it if approached by a syndicate to commit a crime, but regarded the reporting of theft less important and appeared reluctant to come forward with information pertaining to these incidents. Participants also had the opportunity to indicate if they had ever been exposed to crime at the workplace. There were 274 positive replies in the dataset pertaining to the exposure to crime at the workplace. It is evident that employees are exposed to crime incidents and it is therefore essential that all mine employees be thoroughly educated on what acts constitute crime, as well as the responsibility of each employee to report crime (Coetzee & Horn 2007:58-60).

During interviews with the security managers of the participating mine, creating awareness among employees was the most often suggestion advanced to address crime levels in the mining company. According to Participant 5 “crime prevention is not just a security function but a general duty and

should be a mindset of all employees". Participant 10 elaborated by stating that "if we don't tell employees that we have a problem within the company and that it affects them as well, they will not get involved. If you tell employees about the problem and what they can do to assist in fighting the problem, you will find that some of them assist. The message should be concise in that if someone steals from the company, they are stealing from you, as it directly affects your bonuses and salary increases." Participant 15 pointed out that the participating mine adopted awareness campaigns and training of employees with a "zero tolerance for crime" policy.

The participating mine's strict policy against theft and zero tolerance towards crime has been reflected in reviewing the outcome of disciplinary proceedings where offenders had been identified. Termination of employment comprised 81% of all the identified offenders that were employed by the mine either as permanent or contracted personnel and found guilty during the internal hearing (see Figure 3.14).

The police see traditional leaders as indispensable role-players in the fight against crime and believe they play a vital role in crime prevention (Tshehla 2005:17). Moreover, it was found that the police believe traditional leaders should be empowered to administer justice and help prevent crime.

According to Camerer (1996:2-3) social crime prevention should be considered as a long-term project, for it involves addressing the root causes of crime, thus eliminating motive from the equation. In the long term, social crime prevention proposals must address the uneven development factors that underlie the correlation between inequality and crime and need comprehensive employment policies to cope with the overwhelming consequences of structural unemployment as well as underemployment or extremely low-waged work. Employment programmes that expand and upgrade the labour force, producing adequate housing, health care services, educational programmes and so on, have special significance for effective crime prevention beyond simply providing jobs or income to buy these services.

Camerer (ibid) supposed that the years of apartheid in South Africa have led to huge discrepancies and inequality in living conditions and social development, making many South Africans more susceptible to motives for committing crime. Long-term social crime prevention measures should therefore focus on socio-economic development as a comprehensive strategy to transform the socio-economic risk factors that may contribute to crime. Such a strategy can include themes of family-based and school-based prevention, as well as community-based prevention models.

From the discussions thus far, it is evident that the participating mine is not only utilising physical situational crime prevention methods, but has recognised the importance of

incorporating social crime prevention methods to address crime challenges the participating mine experience. Generally the social crime prevention methods are implemented with a primary approach, which includes training and awareness programmes. Social crime prevention methods are also implemented with a secondary approach at many of the sites, whereby social responsibility programmes within low-socio economic communities close to the mining operations focus on addressing poverty, unemployment and youth delinquency. Although not practicable at all the mining sites of the participating mine, it was found that social crime prevention methods are also implemented at some of the mining sites with a tertiary approach focusing on community regeneration, by recognising and incorporating tribal authorities within communities situated close to the mining operations.

As illustrated in Table 4.1 the crime prevention models and approaches that can be considered for a holistic crime prevention strategy for the participating mine include the "law enforcement" approach. Participant 10 explained that the participating mine also engaged in "collaborative projects with the police, prosecutors and other law enforcement agencies" which the participant found resulted in "better arrests and sentencing".

Over the years, with the growth in crime levels and associated increase in public fears about safety and declining service delivery from the police (who in turn were battling with cuts in funding, manpower shortages and lack of resources), many people and organisations in South Africa – private security industry, municipal authorities, businesses, the public and even the police themselves in some form or other started making use of the resources offered by the private security industry in the fight against crime (Minnaar 2007:175).

4.2.4 The crime prevention through effective criminal justice and law enforcement model

The crime prevention through effective criminal justice and law enforcement model is part of the general crime prevention strategy of the South African Government as stated in the White Paper on Safety and Security (South African Government 1998b:27-29). The involvement of the following different levels of government is the key to making this happen:

- National government will provide leadership, guidelines, coordination and, where possible, funding on an incentive basis to ensure effective local implementation.
- Provincial government will coordinate social crime prevention initiatives in the province.

- Local government will actively participate by planning programmes and coordinating a range of local actors to ensure that these are carried out.

According to Pelsler (2002:137) the success of any policy should be measured by how it is implemented and its effect. Given this, it can be argued that the implementation of crime prevention policy in South Africa has had an inauspicious start. The White Paper on Safety and Security which was approved by Cabinet and launched with some fanfare in 1998, was not initially implemented in any systematic way, and in fact, many of its provisions have simply been ignored. Also, with the exception of a victim empowerment programme, the implementation of the 1996 National Crime Prevention Strategy initially focused on criminal justice and policing projects as opposed to prevention projects aimed at impacting on the causes of crime.

4.2.4.1 Community policing

Community policing represents a fundamental shift from the traditional reactive policing approach. It stresses the prevention of crime before it occurs and requires a partnership between the government and citizens to join together in identifying and effectively addressing the underlying conditions that give rise to crime and violence (Rauch 2003:43-46).

Community safety forums (CSFs) were developed in response to the requirements outlined in two documents that have steered the government's crime prevention policy in South Africa, namely the National Crime Prevention Strategy (NCPS) of 1996 and the 1998 White Paper on Safety and Security (Tait & Usher 2002:58). Both sought to improve the functioning of the criminal justice system (and in the case of the white paper, the police in particular) and to enhance the envisaged crime prevention activities.

The NCPS and the white paper recommended adopting integrated and holistic approaches to preventing crime and increasing the efficiency of law enforcement. CSFs are based on the notion, articulated in the policy, that increased co-operation and interaction would ultimately improve the functioning of the criminal justice system and the delivery of crime prevention projects in South Africa. To this end the CSF project has created a replicable structure for integrated problem-solving at local governmental level. As such, CSFs provide a baseline for sharing information and coordinating an inter-disciplinary approach to crime prevention (Tait & Usher 2002:58).

Some of the concepts which highlight the benefits of the CSF approach are the following (ibid:64):

- There is an emphasis on a sustainable, multi-disciplinary approach to crime prevention and a holistic approach to community development on a local basis involving a range of role-players.
- Co-operation by local agencies on a range of problems deepens their understanding of one another's work and enhances collaboration. This increases the possibility for better co-operation and mutual support, which should enable further efficiencies in service delivery. The role-players involved can learn about the pressing issues first hand, rather than through a memorandum from an unknown official in another department or at another level of government.
- CSFs provide the opportunity to obtain feedback on the efficacy of policy.
- Multi-disciplinary forums create a better flow of information between government departments and between government and civil society in a way that single department forums cannot achieve.
- The CSF presents a forum where several levels of government interconnect. Local representatives of a national department are presented with an opportunity to bring their own unique circumstances to bear on questions of better service delivery and crime prevention. In turn, the CSF provides a vehicle for implementing policy more effectively to officials at national level.
- The CSF methodology brings role-players together to plan and develop a common vision for a particular area. The CSFs improve accountability as the responsibility for implementing projects rests with those who introduce them. Projects identified on the basis of national policy are generally better received.

The community policing philosophy is achievable and can be implemented successfully if established holistically (Scheider, Chapman & Seelman 2004:158-159). Scheider et al outlined three inter-related elements that should be implemented, namely organisational, tactical and external elements.

There are a variety of organisational practices that can support community policing and in turn facilitate efforts to improve security and reduce crime. These include:

- *Adopting the community policing philosophy organisation-wide:* In the ideal case, the community policing philosophy should be adopted organisation-wide in the police and be reflected through department participation at all levels, as well as through the mission, goals, objectives, policies and procedures, performance evaluations, training programmes, and hiring and promotion practices. Adoption

of the community policing philosophy partly involves re-engineering departmental processes and resources away from randomness and reactivity towards information and service-driven approaches.

- *Decentralising decision-making and accountability:* In community policing, officers are given the authority to solve problems and make operational decisions suitable to their roles. Leadership and initiative is required and should be rewarded at every level, with managers, supervisors and line officers held accountable for decisions and the effects of their efforts at solving problems and reducing crime and disorder within the community.
- *Fixing geographic accountability and generalist responsibilities:* In community policing, the majority of police deployment and tactical decision-making need to be geographically based. Appropriate personnel should be assigned to fixed geographic areas for extended periods of time in order to cultivate communication and partnerships between the police and their community, and are accountable for reducing crime and disorder within their assigned area. The geographic boundaries should be established based on the communities rather than statistical divisions.
- *Utilising volunteer resources:* Community policing promotes the use of non-law enforcement resources within a law enforcement agency. The government needs to educate the public about ways they can partner with the police to further the ends of community policing and needs to provide effective means for citizen input. Volunteer efforts can help free up officer time and allow police personnel to be more proactive and prevention oriented. Examples of such resources include police reserves, volunteers, organisations and company security divisions.
- *Employing enhancers:* A number of enhancers and facilitators may assist police departments in their transition to community policing. For example, updated technology and information management systems can facilitate community policing and, in turn, promote prevention and response by providing officers access to crime and incident data that supports problem analysis by reducing time spent on unnecessary administrative duties.

The tactical elements of community policing involve enforcing existing laws of the country, and include the following:

- *Informing about the development of new laws and enforcing laws:* Police departments should be active partners in networking with lawmakers and members of the community to discuss improved means to enforce existing laws and to identify laws that need to be amended or endorsed. These activities allow

the police to assist in the development of more effective laws and in the more strategic enforcement thereof.

- *Being proactive and crime prevention-oriented:* Under the traditional model of policing, police departments are highly reactive. The police mostly respond to calls from citizens and focus primarily on arresting offenders after crimes have been committed. Under community policing, police departments focus not only on enforcement, but also on crime prevention and proactively addressing the underlying conditions that cause crime and disorder. The community actively engages in collaborating on prevention and problem-solving activities with a goal of reducing crime.
- *Using problem-solving strategies:* While enforcement is an integral part of policing, problem-solving relies more on preventing crime through a collaborative approach. This can be accomplished through the identification and analysis of problems and by developing focused strategies that may include both traditional and non-traditional responses. These responses focus on deterring offenders, protecting high-risk victims, and making locations less conducive to crime and disorder (Scheider et al 2004:161). External community policing elements recognise that the police cannot solve community crime and disorder alone. Police are encouraged to develop working partnerships to accurately establish community needs and priorities, to use the public as a resource in problem-solving efforts and in developing and implementing interventions.
- *Involving the public and fostering community partnerships:* In community policing, citizens should be viewed by the police as partners who share responsibility for identifying priorities, as well as developing and implementing responses. The police can engage citizen groups as partners in problem-solving, employ citizen volunteers in public safety activities and dialog with citizens about a comprehensive communication strategy.
- *Establishing government and other agency partnerships:* The police are only one of a host of other local government agencies with responsibility for responding to community problems and dealing with crime related issues. Under community policing, other government agencies are called upon and recognized for their abilities to respond to and address crime and underlying social disorder issues. The support and leadership of the government, as well as the co-ordination of the police department at all levels, are vital to the success transforming to a community-policing-based approach (Scheider et al 2004:161-162).

Community policing, like so many popular government reforms, reflects the role of citizens in helping the police to improve neighbourhood safety (Thacher 2001:3-4). The

trouble the government faces, however, is that the ideal of being responsive to individual community groups often conflicts with the equally important ideal of equity, which directs the police to provide a fair service to all segments of the public. The source of this dilemma is that police-community meetings are not attended by the whole community and that it is often difficult to find neighbourhood groups and other willing partners in poor neighbourhoods compared with wealthier ones. As a result, if police are responsive to the community groups that do organise, they run the risk of instituting biased priorities that benefit the better-off at the expense of the poor. Whether there is an effective way to mitigate this dilemma is a centrally important question for community policing. In an area with ten communities, is it improvement or retrogression when the police develop partnerships with five?

According to Liebermann and Coulson (2004:125) community policing and social crime prevention remains more a talked-about concept than a practice really taking place in South Africa currently. In spite of much legislation and various literature available pointing to the need for people's participation, there is limited understanding of how this should be done.

Although South Africans seem to complain incessantly about the government's effectiveness in addressing crime, it was found that almost two-thirds (63%) of South Africans indicated in a Markinor opinion poll (April/May 2007) that they had done "nothing" to address crime in their communities (Harris & Radaelli 2007:1-4). Results from the Ipsos Markinor public opinion survey of 3,558 South Africans conducted in November 2010 indicated that between 51% and 74% of respondents rated the government's performance on "bringing the police closer to the community" between "very well and fairly well" (Harris & Greyling 2011:3).

Despite difficulties the government faces in cultivating an interest in some of the localised community policing initiatives, various large public sector initiatives have been implemented successfully. According to Participant 15, the foremost important method to curb theft is to address the "black market" with intelligence-driven operations and "that the legislation available in terms of the precious metals act, second-hand goods act, prevention of organized crime act, should be utilised to its full potential. In order to succeed the criminal justice system, police and mining industry must address the threat in a collaborative approach".

The participating mine has been supporting two such successful community-based policing initiatives for many years, namely an initiative against copper theft and an initiative against theft of precious metals, which will be discussed briefly below.

The Non-ferrous Metal Theft Combatting Committee (NFTCC) under the management of Business Against Crime South Africa (BACSA) was formally established in 1993 as an integrated body of role-players that provides strategic guidance and direction for the process of preventing and eradicating theft of non-ferrous metals, copper cable, in particular. The NFTCC has one national committee and 28 regional committees which are strongly supported by government (Van den Berg 2007). In conjunction with partner organisations and government departments, the NFTCC developed a revised strategy addressing areas such as the illegal export market, which placed a great emphasis on the need for the full commitment, leadership and involvement of government agencies and stakeholders to drive the initiative, with the appropriate levels of authority, budgets and political will. The NFTCC seeks to disrupt the enabling factors for the thefts rather than addressing only the symptoms. To succeed in this initiative, the national, provincial and regional structures have been established in line with the strategy and special police task teams have been formed in all the provinces, which have been grouped and supported by private sector initiatives. Furthermore, dedicated prosecutors have been identified to deal with the non-ferrous theft cases in all provinces and regions and a National Port Authority (NPA) Task Team has been established in KwaZulu-Natal to deal with the export of containers leaving Durban Harbour in particular. The export process and relevant legislation have been interrogated with the assistance of the Department of Trade and Industry (DTI) and South African Revenue Services (SARS) to ensure legislation addresses the needs to more successfully manage the threats identified (BACSA 2008a). Furthermore, a national communications task team has been established with the aim to build general community support for the work of the NFTCC in order to close down the illegal markets supplied through the theft of non-ferrous metals. Greater community involvement and a social marketing approach to encourage the reporting of crimes and any information related to the work of syndicates and illegal operations which impact the general functioning of the country in terms of electricity, transport, communications and other services have been adopted (BACSA 2009).

The National Precious Metals Forum (NPMF) was initially established in 2002 as a joint initiative between nine mining houses and the (old) SAPS' Diamond and Precious Metal investigation branches. Its function and role is primarily to investigate and analyse high-ranking syndicates involved in the theft of precious metals. All the participants of the initiative contribute to the team's operational support, which includes vehicles, personnel and funding. The most important contributing factor to the success of this initiative is the sharing of information by all participants to collectively address the problem (Coetzee & Horn 2007:79-85). This initiative was then incorporated as a special task force known as the *National Precious Metals Forum*, which was established especially to initiate a coordinated approach between the SAPS and the mining industry to combat precious metals' theft. The restructuring of the detective division in particular has caused some concern in the South African mining industry. The industry perceives the integration of the Diamond and Precious Metal branch detectives into other detective branches as a detrimental loss of investigative expertise and trust. The mining industry believe they would not receive adequate service from the detectives located at police

stations, compared to the service they have received from the 'specialist' Diamond and Precious Metal branch detectives (Coetzee & Horn 2007:79-85).

This ongoing initiative has achieved some excellent successes over the last few years. In March 2010 a meeting was held with all the relevant law enforcement and intelligence structures to co-ordinate the government's efforts to assist the mining industry to combat illegal mining. This in turn led to the establishment of a multi-agency in July 2010 under the leadership of the Directorate for Priority Crime Investigations (the Hawks). In addition to the national approach, international activities are also underway to assist in addressing the problem which includes discussions between the governments of South Africa, Zimbabwe and Mozambique, and discussions with the European Police Office and the European Union. Discussions have also been initiated with the United Nations to ultimately regulate the possession and trade of precious metals internationally in order to address the illicit market (Chamber of Mines 2010:125-126).

4.2.4.2 Sector policing

Sector policing is a United Kingdom-based policing model that can be traced back to the early nineties, and was initially referred to as neighbourhood policing. Sector policing adopts a more decentralised approach to policing, intended to address the root cause of crime at particular geographical locations in partnership with the communities at local level (Marogo 2004:1).

According to Steinberg (2005:27-28) sector policing is a vague and unstructured term which has been through a thousand definitions and redefinitions. In terms of the draft National Instruction issued by the SAPS national commissioner in December 2003, it entails dividing police stations into sectors and organise community-police sector crime forums (SCFs) in each sector. The changes to policing envisaged by this instruction are organisationally modest. It envisages that only one or two personnel be redeployed from patrol and response work to set up SCFs. It is therefore possible for police stations to implement the instruction without introducing substantive changes to grassroots policing. The philosophy behind sector policing is however a good deal more substantial than that. The rationale for dividing station jurisdictions into sectors was aimed at getting small teams of police officials to know particular neighbourhoods intimately. The idea was not only to know their sector's crime trends well, but with thought, innovation, and the necessary organisational support be able to identify the specific problems that fuel particular crime trends, and to solve or manage those problems. Thus, while the knee-jerk reaction by SAPS to an increase of vehicle thefts would be to throw up roadblocks around vehicle theft hotspots on a Saturday morning, sector policing would try to identify

what in the physical and social environment caused the hotspot to emerge and how to deal with those causes.

In spite of sector policing failing in the UK, the SAPS seem intent on implementing and succeeding with it in South Africa. They seem to have learnt from the mistakes made by other police agencies as well as lessons learnt from the pilot project launched in Johannesburg (Mahuntse 2007:32). During a research survey held to determine the views of police officials from the Johannesburg Central Police Station about the implementation and management of sector policing in this area, almost all the respondents (94%) held the opinion that sector policing is an ideal mechanism in the fight against crime (Mahuntse 2007:63-64).

In addition to the NFTCC and NPMF community policing initiatives discussed above, which the participating mine supports, the participating mine has also been involved in various sector policing initiatives specifically focusing on crime hotspots close to the mining operations. Collaborative searches with the police of possible "black markets" and even the residences of identified offenders have proven successful. As mentioned in Chapter 3 (see Table 3.9), 74 of these offsite collaborative searches have led to successful arrests during the five-year period in the dataset.

From the discussion it is evident that the crime prevention methods applied by the participating mine through law enforcement includes a primary approach, namely physical patrols and searches, as well as a secondary approach, namely involvement in community policing initiatives. At some of the mining sites, the tertiary approach is utilized very successfully with site-specific law enforcement initiatives. According to Participant 10 "the problem is that the moment the projects are terminated the crime returns to the area. The message is therefore clear that security managers must not only react when crime becomes a problem at their mining sites, but work on the problem continuously."

Table 4.1 illustrated the different crime prevention models and approaches explored in this chapter to unpack the crime prevention strategy of the participating mine. It was determined that the participating mine included situational, social and crime prevention through law enforcement prevention measures on a primary, secondary and tertiary level as part of the company's crime prevention strategy. It is therefore evident that the participating mine makes use of an integrated and comprehensive crime prevention strategy. Asset theft remains a problem at the participating mine, however. In order to address asset theft with a holistic crime prevention approach, factors that may have an

influence on the crime prevention strategy of the participating mine needs some consideration.

4.3 FACTORS AFFECTING CRIME PREVENTION

In contrast to the conventional believe that crime is mostly the result of contributing factors such as historical events, socio-economic factors, alcohol and substance abuse, there is also the belief that crime can be the result of a calculative analysis of opportunity.

There is often concern that focusing prevention resources on hotspots will simply displace the crime to non-targeted areas (Weisburd, Wyckoff, Ready, Eck, Hinkle & Gajewski 2005:2). However, when immediate spatial displacement was examined, the findings supported the position that displacement was less and that diffusion of crime control benefits was more likely.

A substantial number of research studies on factors affecting crime prevention strategies were carried out, including those by Ehrlich (1973), Cornish and Clark (1987), Felson and Clarke (1998) and Di Tella and Schargrotsky (2004). The common trend that emerged from these studies is the importance of considering the relationship or link between policing efforts at hotspots, as well as crime prevention strategies, crime displacement and crime diffusion when formulating a holistic approach to crime prevention.

Literature on the rational choice theory, crime displacement, crime diffusion, as well as the continuous change and interaction between these factors, will now be explored in the context of the crime prevention strategy of the participating mine.

4.3.1 The rational choice theory

The likelihood of a target becoming prone to criminal incidents depends upon many factors (Clarke 1999:22-23). It can be argued that a target causes criminal temptation due to a combination of factors also characterised as the so-called "hot products, person and object".

"VIVA" is a characteristic model indicating this "hot factor" approach:

- *Value:* The basic value of the object may motivate potential offenders.
- *Inertia:* The items of lighter weight (such as equipment, tools, laptops and cell phones) are more preferred by offenders than heavier items weight.
- *Visibility:* Objects displayed in view become more suitable targets.

- Access: Easy access to the object causes makes it easier to commit a crime.

VIVA however has some serious limitations as a model of hot products as it was intended to cover all targets of predatory crime, not just the targets of theft. The VIVA model avoided any consideration of motivation and therefore neglected the specific motives for theft. The model further neglected those target characteristics that are important when contemplating theft and when seeking to conceal or dispose of stolen goods. According to Clarke (1999:23-36) these limitations were addressed in the modification of VIVA that resulted in another model explaining the incidence of theft known as "CRAVED". This model identified six important characteristics of "hot products" in that they are generally:

- Concealable
- Removable
- Available
- Valuable
- Enjoyable
- Disposable

Another theory that closely links to the "VIVA" and "CRAVED" models is the "rational choice theory" (Melberg 1993:1-5). The rational choice models provide a "rule of thumb" about how an action is chosen (a mechanism) by an individual in the sense that the choice of action in an interactive situation is often governed by attempted maximisation according to specific aims. Applied in the field of criminology, this theory assumes that offending behaviour is designed to benefit the offender in some way. It seeks to understand how the offender makes crime choices, driven by a particular motive within a specific setting, which offers the opportunities to gratify that motive.

While criminals are generally considered to be driven by their conditioning and their environment, economic-based theories portray them as rational decision-makers who base their decisions to commit crimes on an analysis of the risks of the crime compared with the expected profits (Geason & Wilson 1988:4). In other words, the criminal does a "cost-benefit analysis" based on the assumption that offenders actively choose to commit crimes and that the decision to commit the crime is made in response to the immediate circumstances and the immediate situation in which the offence is contemplated. The motivation to offend is not considered to be constant or beyond control, but rather dependent on a calculation of costs and rewards than being the result of inheriting or acquiring a disposition to offend.

As discussed in depth in Chapter 3, the participating mine experienced significant increases in copper-related thefts during 2009 as a result of an organised criminal threat at some of the mining sites that had various redundant underground mining operations where no active mining was done. While offenders that steal on surface are limited to what they can conceal and carry, these organised groups had weeks to strip the copper cable and were able to move vast amounts of stolen copper during these underground thefts, thereby increasing the losses exponentially (see Figure 3.3).

When formulating a holistic crime prevention approach, it is also important to consider the implications of the rational choice theory. Many participants in the case study shared experiences on how offenders continuously test the security measures implemented at the participating mine. Participant 10 held the opinion that "any security measure that is implemented is only as good as those that enforce it. The problem is that in some cases hundreds of cameras are installed but they are not properly managed to ensure that employees know that they are being monitored. Experience taught us that employees test systems for minor issues to see if action will be taken against them, for example. If nothing happens they move to the next level and later remove property because they know that they are not being watched."

In the literature review it was found that research into the theory that criminal activity arises from a rational assessment of the costs and benefits of crime was exceptionally prevalent after Becker's economic model of crime was published in 1968. There has been great interest in conducting research and crime studies on the economics of crime, and in particular, establishing the impact and possible role crime prevention strategies as well as law enforcement plays on displacing crime (Yang 2006:1-2).

In the dataset analysed in Chapter 3, it was found that the available "black markets" may have an impact on the type of asset at risk at the participating mine. A correlation was found between increases and decreases of the copper-related thefts and the increases and decreases in the international copper price, while a further correlation was found between decreases in copper-related thefts and simultaneous increases in other type of asset thefts.

4.3.2 Crime displacement

The key concepts in situational crime prevention, according to Gilling (1997:182), are opportunity and physical environment. SCP is described as those interventions designed to prevent the occurrence of crimes, especially by reducing opportunities and increasing risk. It is however argued that crime displacement considerably weakens the effectiveness of SCP measures, for while crime rates may decrease in the area where situational projects have been undertaken, they might increase in other areas where

these measures are not present. The most common criticism of SCP is that it does not solve the problem of crime but merely displaces crime (Geason & Wilson 1988:7). An SCP approach may therefore result in that the criminal tries again, there or somewhere else, or turns to another type of crime.

Participant 10 explained the phenomenon by means of the following example: "In one such case we concentrated on theft of cables on a specific mine. We involved the SAPS, prosecutors and other law enforcement agencies in that specific area. We arrested criminals, achieved good sentencing in that area from the courts after aggravating evidence was given. We closed illegal scrap dealers down. We prosecuted scrap dealers not adhering to specific Acts. We held surprise road blocks in areas near scrap dealers with good results. We then monitored the theft of copper in the other areas around this specific mine and it become evident that the criminals moved to the other mines in the area." Participant 5 even stated that it is important to evaluate the crime prevention strategy by "trying to be one step ahead of competitors in the same vicinity, as criminals will then rather target them".

Barnes (1995:96-97) stated that crime may be displaced when offenders are prevented from committing one crime and simply shift their manner of offending in some way so that they may replace the prevented opportunity with another unlawful act.

Participant 7 shared the experience that "with the improvement and hardening of targets, the criminal tends to shift focus to more soft targets". Participant 11 pointed out that "when the preventative measures overcome the resolve of the criminal, he will shift his attention to another type of crime, or location, target or time".

Although displacement of crime may be minimal, conclusive proof of the phenomenon is extremely difficult to obtain because displacement can in theory take so many different forms (Ratcliffe & Makkai 2004:5).

In the above regard, Participant 4 expressed the opinion that "crime displacement is the strategy that professional criminals use to misdirect or mislead the law enforcers to focus on wrong and non-profitable and/or valueless crime prevention strategies". For example, copper cable may not be secured around the mine area, resulting in the security personnel having to focus more on potential recoveries "while white collar crime is happening in the back yard". It is therefore, according to Participant 4, important to "always focus on crime in general, be risk driven and question any situation that is happening in your surrounding as why it is happening in this way. Is it a general norm, is it permissible by law, why just a sudden change? Why by this specific person/s. Know your area, geographically factors, environmentally factors, cultural influences, community interactions, etc."

Felson and Clarke (1998:25) classify the types of crime displacement that could occur when a crime is prevented:

- Crime can be moved from one location to another (geographical displacement).
- Crime can be moved from one time to another (temporal displacement).
- Crime can be directed away from one target to another (target displacement).
- One method of committing crime can be substituted for another (tactical displacement).
- One kind of crime can be substituted for another (crime type displacement).

Participant 6 provided an example of how the evaluation of crime displacement forms part of the participating mine's crime prevention strategy, stating: "We have experienced this first hand. As target-hardening techniques and other crime prevention measures were implemented in the high-risk area, the threat just moved to our low-risk area as it was too difficult to succeed with criminal activities in the high-risk area. Security measures and process flows were addressed in the low-risk area as well. The fact that crime displacement can occur on site forms part of our crime prevention strategy – in other words the scope of addressing the threat is broadened to accommodate the possibility of crime displacement."

The threat of crime displacement has created more concern than any other externality associated with preventive strategies (Mikos 2006:20-21). Displacement of crime is thought to lack any socially redeeming value. To understand why, consider the worst-case scenario called "total displacement", that is, every crime that is prevented against a precaution taker is instead committed against someone else; the overall crime rate is therefore left unchanged. The losses suffered by the victims of displaced crimes cancel out the gains acquired by precaution takers. Furthermore, precaution takers have spent resources, but to no societal benefit. The conventional wisdom thus concludes that prevention strategies that do nothing but shift crime are necessarily wasteful, from a social point of view.

4.3.3 Managing an ever-changing threat

The core component of crime prevention good practice is the adoption of an effective problem-solving methodology (Laycock 2005:676). The approach is characterised by a series of steps that involves problem identification, crime data analysis, the selection of strategy objectives based upon this assessment process, implementation, and evaluation of impact achieved.

A crucial thrust of the problem-solving approach is the need to be systematic about the process and not to jump to conclusions before the problem assessment stage has been carried out completely (Cherney 2006:1-2). The in-depth problem analysis derived from

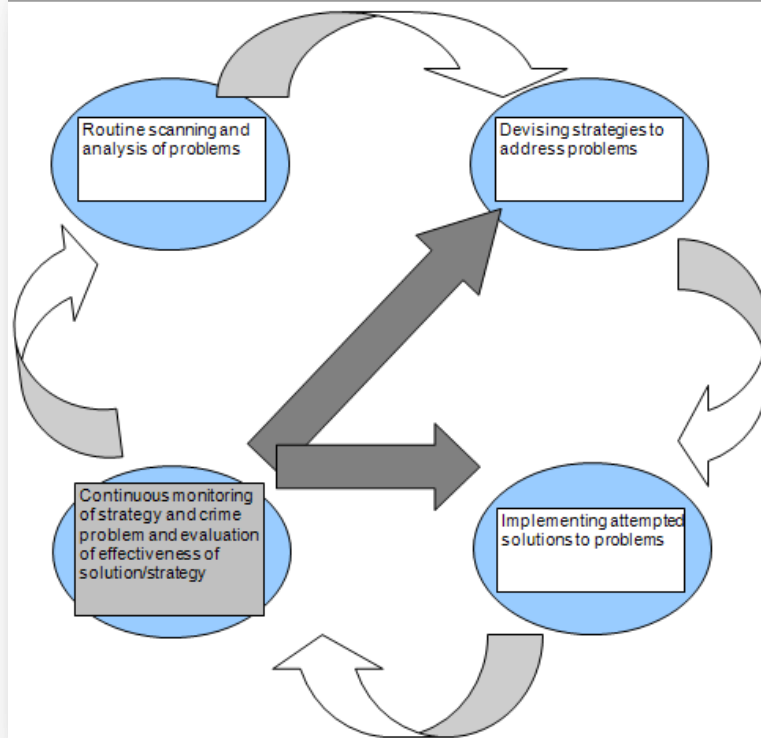
solid data is very much seen as the kingpin of this methodology given that it will determine the success of the final result, namely the "response" and its "impact".

A number of schematics and guides have been developed to assist in finding the optimal problem solving methodology in practice, the most common being the "SARA" model, namely "scan, analyse, respond and assess" (Scheider et al 2004:161). Crime prevention practitioners and departments can utilise a range of existing data sources ahead of time to develop detailed risk management assessments and crisis plans. Identification of potential target areas (crime hotspots) in local jurisdictions is an important first step (scanning). Problem-solving strategies encourage further complex analyses of the possible threats, the relative likelihood of occurrence, and the potential impact of possible response strategies (analysis). It is important to work in conjunction with government, social and community entities to develop detailed crisis response and prevention plans based on the analysed threats (response). Finally, the continual refinement of these response and prevention plans to suit changing conditions and threat levels through the use of drills and regular response reviews are encouraged (assessment).

Eckblom (2003:2-3) has developed a problem-solving process known as the "5 Is model". This problem-solving model involves information gathering and data analysis of the specific crime problem (intelligence); selection of the full potential range of responses to address the identified proximate and distal causes of the crime problem in question (intervention); action to convert the identified responses/interventions into practical methods (implementation); mobilisation of the identified key stakeholders and agency participants (involvement); and comprehensive and holistic evaluation of achieved outcomes (impact).

Senge (2006:73-74) states that "reality is made up of circles but we see straight lines. Herein lie the beginnings of our limitation as system thinkers." It is argued that what we see depends on what we are prepared to see. If we want to see interrelationships instead of a linear view, we need a thinking system made up of circles.

Figure 4.1: Problem-solving processes and changes



The continuous evaluation of the progress and results and feeding this information back into all stages of the problem-solving process are likewise regarded as an essential component to ensure that it remains effectual (Forrest, Myhill & Tilley 2005:3). Hough and Tilley (1998:7) illustrated the complex and intrinsic relationship between the problem-solving processes and stages (Figure 4.1).

During the five years of conducting research relating to the participating mine's crime prevention strategy, it was found that the operational strategy was continuously revised and amended as security risks emerged. In addition, the strategic crime prevention strategy was revised annually with a comprehensive strategy planning week attended by a quorum of all the security managers. The participating mine had recognised the importance of continuous evaluation of their crime prevention strategy to keep abreast with the changes in criminals' modus operandi and emerging security threats. The participating mine adopted a problem-solving process which they referred to as the "intelligence cycle" and which formed part of their overall crime prevention strategy.

The "intelligence cycle" of the participating mine comprised the following steps:

- *Problem statement:* Formulate an accurate problem situation using vulnerability and risk assessments to define the security risk.
- *Problem appreciation:* Highlight the applicable deficiencies of the current strategy to address the nature of the emerging problem and formulate a hypothesis.
- *Collection management:* Gather information on the extent of the problem and adjust the hypothesis to incorporate all information received.
- *Evaluation:* Determine whether hypothesis of the new risk is reliable.
- *Dissemination:* Communicate new risk timeously and effectively.

- *Implementation:* Make use of the “plan/do/check/act” process to develop and implement security solutions to address the risk.
- *Standardise the solution:* Identify systemic and procedural amendments required as well as new training needs and plan ongoing monitoring of the solution.

Participant 15 expressed the importance of ensuring that “proper controls are implemented to evaluate the effectiveness of security measures and conduct continuous risk assessments to the effect”. In the participating mine’s crime prevention strategy, the following quote is used to express their understanding of the ever-changing threat they face: “When it is obvious that the goals cannot be reached, don't adjust the goals, adjust the action steps – Confucius.”

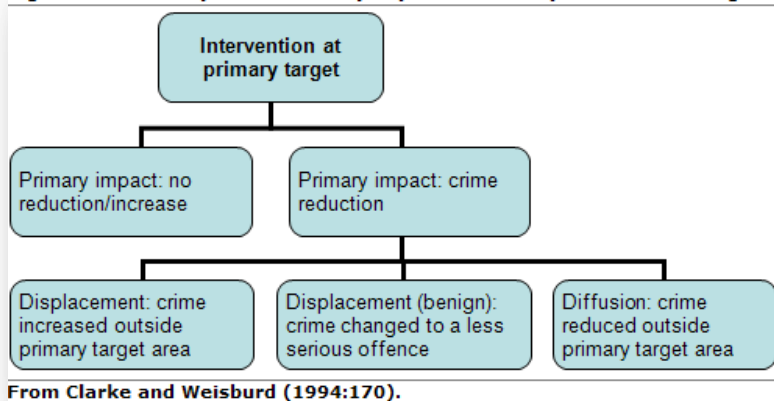
Patterns of crime should be reviewed as the outcome of crime control policies and the distribution of opportunities (Barr & Pease (1990:277-278). It is often argued that crime control policies have a limited effect as they merely displace crime. Displacement alone is however an inadequate concept, a better formulation encompasses the deflection of crime from a target. However, better information management systems are required to show displacement and deflection of crime in order to assist in monitoring the distribution of crime through time and space and to highlight the true crime patterns and effectiveness of prevention strategies.

4.3.4 Crime diffusion

If the advocates of situational prevention were less preoccupied with the displacement threat, criminological theories could have been developed earlier to address situational and choice factors that deflect crime (Clarke & Weisburd 1994:165). What has been overlooked is that the results of displacement may sometimes be “benign”, for example by spreading the burden of victimisation more equitably across a community, or by replacing more serious with less serious crimes. Furthermore, the effects of situational prevention measures may sometimes extend beyond the targeted offences to bring more general benefits of crime reduction. This is the “complete reverse” of displacement. This phenomenon has been noted in a number of evaluations of situational prevention measures, without its general nature being truly recognised. Consequently, a variety of terms have been used to describe it. Adoption of a standard terminology and definition would assist to understand these processes.

The term “diffusion of benefits” was proposed by Clarke and Weisburd (1994:167) to refer to the spread of the beneficial influence of an intervention beyond the places which are directly targeted, the individuals who are the subject of control, and the crimes which are the focus of intervention or the time periods in which an intervention is brought. Whereas crime displacement refers to the processes that shift crime away from the

Figure 4.2: Primary and secondary impacts of crime prevention strategies



targets that are the focus of the crime prevention efforts and measures, diffusion is concerned with the processes that spread the crime reduction benefits beyond those targets. Recognition of diffusion will bring a much-needed balance to criminological

analysis of crime prevention and security measures, but it also provides an opportunity for maximising crime control benefits. If the processes that lead to diffusion could be identified within a business or community, crime prevention strategies designed to harness this phenomenon could be more clearly defined (see Figure 4.2).

A good example of the potential benefit of “deterrence” to maximise crime diffusion is Sherman's (1990:11) “free bonus” effect of police crackdowns. Sherman identified that the deterrent effect was carried over beyond the period that the crackdown was enforced. Even though offenders were no longer under an increased threat of detection and arrest, many of them continued to believe that they may be and behaved accordingly. Sherman's proposed solution is to manipulate uncertainty about the risks by using available patrol resources in a continuous series of crackdowns and back-offs rotated randomly at different times and places. This keeps potential offenders in continual uncertainty about the actual risks and may lead them to overestimate the prevention measures just in order to be safe.

The participating mine could consider utilising the vehicle and security patrols more strategically with different intervals, random changes in patrolling routes and patrolling times, and unexpected “crackdowns” at some of the identified hotspots. This approach may also be useful if a mining site has limited manpower resources in order to maximise the impact of the security patrols. Security patrol is a preventive resource of considerable flexibility, but Sherman's strategy of creating uncertainty about actual risks can be

further adapted to enhance diffusion of benefits for situational prevention measures that are "fixed", for example surveillance cameras or access control points.

Sometimes the deterrent reach of situational prevention measures seems to be overestimated by potential offenders, who believe that they are under a greater threat of apprehension than is really the case. Poyner's (1988:50) evaluation of the use of CCTV to address vandalism and graffiti on a fleet of buses in the north of England is a good example of how diffusion can be used to maximise the effectiveness of "fixed" situational prevention measures. Even though live cameras were installed on only two of the eighty buses and dummy cameras on another three, vandalism and graffiti decreased significantly for the whole fleet of buses. This diffusion was assisted by some well-publicised arrests of juvenile vandals resulting from the use of the CCTV systems. In another study to evaluate a new CCTV system installed to protect parking lots at the University of Surrey, Poyner (1991:100) found another considerable reduction in auto thefts at parking lots that were not protected by the new cameras. The diffusion was again assisted by well-publicised arrests that the CCTV system enabled the security guards to make the arrests.

The participating mine could consider utilising surveillance technology more strategically as well as advertising successes as a result of the use of CCTV systems. It is often found that employees are aware of which areas are under surveillance. It is further found that employees who were apprehended for theft are often discussed among other employees. Uncertainty about where surveillance is conducted could therefore be created with such "advertising", which could prove beneficial if employees become unconfident as to the exact extent of the security surveillance.

Another form of diffusion that was evaluated successfully is the "discouragement" of potential offenders identified in Pease's (1991:73-77) evaluation of the replacement of coin-fed gas and electricity meters with ordinary billed meters to reduce burglary on a British public housing estate. Although meters were removed only from homes that previously suffered a burglary, the benefits of a reduced burglary risk diffused throughout the estate as a whole. According to the rational choice perspective, potential offenders consider effort and reward. When the former has become incommensurate with the latter, potential offenders may be discouraged from crime even if the risks of detection have not increased. Another way of maximising diffusion may therefore be to concentrate protective resources and prevention measures on the most highly visible or attractive targets in the hope that potential offenders will assume that preventative action has been taken more generally than, in fact, is the case.

The City of Lakeland, Florida, began an urban renewal project in 2004 in a downtown area that was one of the oldest in the city. This area had significant crime problems, a considerable poor population, and was in a state of decay. Smith (2006:33-35) conducted a strategic assessment on the successes of the Parker Street Urban Renewal Project as it appears to have had a significant impact on crime in the Parker Street area. Since the renewal project began, crime has decreased in the Parker Street area, but simultaneously crime increased in adjacent areas. Displacement issues frequently challenge the overall effectiveness of place-oriented police interventions. It was found that if third-party policing incorporates aspects of all the crime prevention attempts to identify a problem area, assess the problems, and devise a plan to share the problem with the community involved, the initiatives are more successful, as long as the community continues to move forward following the crime and ushering it forward using these tactics. Similarly at the participating mine, effective communication and collaboration between the different mining sites can reduce the shifting of a problem from one mining site to another mining site.

Many participants in the study highlighted crime displacement as a factor they need to manage as part of their crime prevention strategies on the participating mine. Participant 15 stressed that "security measures need to be implemented with proper controls, audits and continuous evaluation for effectiveness to ensure that crime displacement does not come into effect". None of the participants however indicated that tactical crime diffusion forms part of their crime prevention strategies at the participating mine. Exploring the benefits of strategic crime diffusion as part of a holistic and integrated preventive strategy to address asset theft at the participating mine could prove beneficial. The concepts of crime diffusion discussed above could be utilised at the participating mine to enhance the physical security measures implemented as well as their efforts to mitigate crime displacement.

4.4 SUMMARY

Although various crime prevention approaches, models, strategies and measures are highlighted in the available literature, the crime prevention strategies found to be most prevalent at the participating mine to curb asset theft included the following:

- Physical security measures commonly used as part of a situational crime prevention approach and crime prevention through environmental design as well as crime reduction through product design;
- Social crime prevention approaches including awareness campaigns, community upliftment projects and initiatives aimed at increasing the reporting of crime;

- Collaboration with law enforcement and participating in community policing and sector policing initiatives to facilitate a joint effort to address crime affecting the mining operations.

Factors that influence crime prevention efforts have also been highlighted by the participants of the study and the importance of addressing factors like crime displacement as part of a holistic and integrated crime prevention strategy was expressed. Furthermore, the crime prevention strategy of the participating mine is continuously being reviewed and amended to keep abreast with changes.

Chapter 5

Findings and recommendations

5.1 INTRODUCTION

The discussion in Chapter 4 focused on the building blocks of the different crime prevention approaches and strategies that could be considered in addressing the research question (see Table 4.1). This table formed the basis for a discussion of situational crime prevention approaches, social crime prevention approaches, and law enforcement crime prevention approaches on a primary, secondary and tertiary level.

In order to unpack the crime prevention strategy of the participating mine in a logical manner, Table 4.1 will be used to discuss the findings of this case study in context with the research question: "Which crime prevention approaches to curb asset theft are practicable at the participating mine?"

5.2 CRIME PREVENTION STRATEGY AT A SOUTH AFRICAN MINE

Crime prevention is contentious and therefore different people will have different conceptions of what it should entail and different agendas in terms of the kinds of organisational and philosophical objectives they are trying to meet (White & Haines 1996:98).

In the context of the participating mining company, the shareholders require that money spent on security be evaluated in terms of the return on investment (ROI). According to the security managers at the participating mine, security measures are being evaluated on a continuous basis and are annually audited in order to find the most effective preventive security measures in terms of the most effective ROI. According to Participant 2, the ROI is generally determined through "cost-to-benefit exercises" to ensure that the security measures implemented are cost effective. This organisational objective has a considerable influence on the crime prevention strategy implemented at the participating mine.

5.2.1 Situational crime prevention approach

As mentioned, in the period under review the participating mine mainly used crime prevention measures such as target hardening, access control, security searches and

patrols, and state-of-the-art security technology as part of their primary situational crime prevention model. In addition, CPTED and CRPD principles formed part of the selection and implementation of situational measures, where feasible.

On a secondary level, risk assessments and vulnerability assessments were used to evaluate and revise the situational security measures. Furthermore, the participating mine is conducting comprehensive audits annually at all sites to review the effectiveness of the security measures and to make recommendations on improving the security approach and to prevent recurrence of incidents.

On a tertiary level, joint operations were held with the safety department proto-teams of the participating mine at hotspot areas in the mining high-risk areas, for example at redundant underground sites.

During interviews held at the participating mine, all the participants mentioned that they perceived situational crime prevention measures such as security searches, patrols, access control and surveillance to be effective. All of them mentioned, however, that if physical and technology security measures were not reinforced with proper controls, continuous maintenance and effectual audits, these measures could give a "false sense of security".

The effect of the participating mine's continual security measure audits and evaluation strategies became clear when trends in asset theft incidents at the different mining operational sites were examined. It was found that in 2007 there had been a significant increase in all three high-risk areas, accompanied by a significant decrease at low-risk mining operations. In 2008 and 2009 there was a slight increase at the mining operations and concentrators while the two highest-risk areas showed a gradual decrease. During 2010, there was a significant decrease at all the mining sites but a significant increase in the highest-risk areas (see Figure 3.7).

The participating mine was approached to elaborate on these changes. It was found that notable changes in crime trends were always followed by changes in security measures. The same was found for changes in the type of asset stolen (at risk).

Additional factors that may influence situational crime prevention measures such as crime displacement were considered by the participating mine and formed part of the risk assessments and vulnerability assessments conducted in order to revise target hardening, access control and use of security technology. However, as at the end of 2010, strategic and tactical crime diffusion had not yet been incorporated into the crime prevention strategy of the participating mine. Utilising resources available to the

participating mine, and incorporating a more strategic and tactical approach to crime displacement, could enhance the mine's proactive approach to curbing asset theft.

5.2.2 Social crime prevention approach

As mentioned in Chapter 3, in the dataset comprising 2,735 offenders identified in asset theft-related incidents recorded at the participating mine in the period 1 January 2006 to 31 December 2010, it was found that only 29% of identified offenders were trespassers on the mine while 71% had been given access by the mine either as permanent employees or as employees of contracting companies (see Figure 3.13). This circumvented most of the general and basic types of SCP measures.

Employee awareness is therefore an important element of the primary social crime prevention approach. In this regard, during interviews held with security managers of the participating mine, most participants expressed the importance of creating awareness of crime and of cultivating reporting of crime among employees. Participation of the security division in awareness campaigns aimed at cultivating an attitude of "zero tolerance" to crime among employees thus formed part of the crime prevention strategy of the participating mine. In order to encourage crime reporting among employees, the mine further made use of an anonymous whistleblower programme and reward system for information that led to successful prevention of crime or identification of offenders.

Correspondingly, it was found in the dataset of the participating mine that the "zero tolerance" approach towards crime policy was applied fairly consistently. Termination of employment (including personnel that resigned before the hearings were finalised, deserted or were dismissed) comprised 81% of all identified offenders that were employed by the mine either as permanent or contracted personnel and found guilty during the internal hearing (see Figure 3.14). Furthermore, criminal action was taken against 1,814 of identified offenders. Of 1,603 criminal cases in the dataset that were finalised, 41% of identified offenders were convicted, of which 65% were employed by the mine and 32% were trespassers. Of the 656 offenders in the dataset convicted for asset theft, only 5% received effective imprisonment (see Table 3.6).

On a secondary level, the social crime prevention approach of the participating mine focused on addressing issues in communities close to the mining operations. Special projects aimed at addressing unemployment and poor socio-economic situations which could contribute towards criminal activity were initiated within the communities in collaboration with other divisions in the participating mining company. These projects include "self-help" employment programmes, "skills training" programmes, "interpersonal

peer drive” programmes with entertainment and sports facilities for the youth, to mention but a few.

As part of the social responsibility drive of the participating mine, various long-term community enrichment projects were managed by a dedicated community engagement division within the participating mining company. These projects included the provision of housing, building of schools and medical clinics, and providing support for primary needs such as fresh drinking water, electricity and sanitation.

On a tertiary level of the social crime prevention approach, where plausible, the security division was engaged in projects to address issues concerning security or possible community conflict and played a supporting role focusing on community regeneration by recognising and incorporating tribal authorities in communities situated close to the mining operations.

5.2.3 Crime prevention through law enforcement approach

In the period under review, crime prevention through effective criminal justice and law enforcement formed part of the participating mine’s crime prevention strategy. On a primary level, the participating mine had engaged the local police, prosecutors and magistrates of the local courts, as well as members of the special Directorate for Priority Crime Investigations and organised crime investigation officers. Making use of collaborative and joint teams, various operations were carried out to identify possible “black markets” such as scrap dealers who trade with stolen copper cable, arresting suspects in informal settlements close to the mining operations, and even addressing the underground illegal access threat. The success of this collaborative approach was highlighted in the commendable conviction rate of 41% (656 convicted offenders in the dataset analysed, see Figure 3.15).

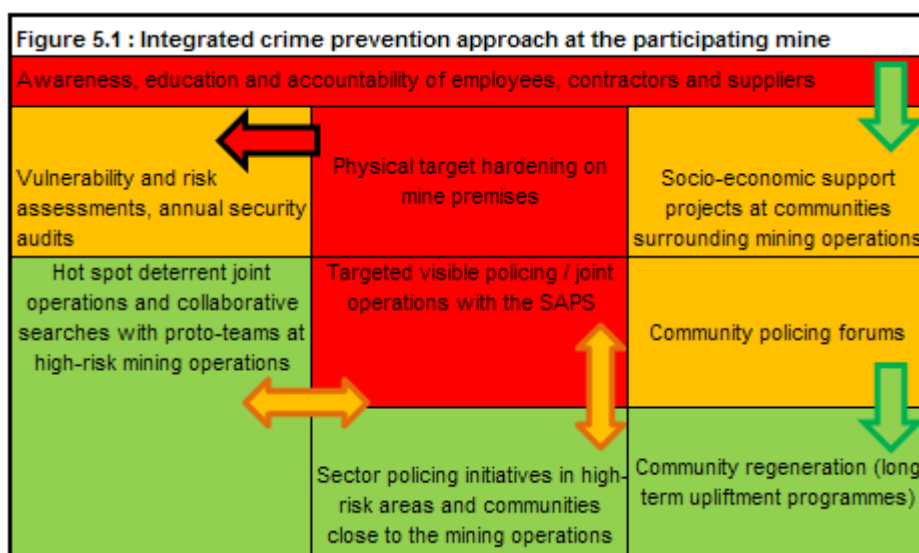
On a secondary level, the participating mine’s security division supported community policing initiatives. The support of the NFTCC and the NMPF in particular formed part of the collaborative security approach to address two of the highest-priority crimes at the participating mine, namely theft of copper and theft of product. As part of these policing initiatives, the participating mine facilitated specific training initiatives such as “product awareness” among border police officers and security officials at harbours. Many mining products are unfamiliar to police officers and therefore they may be unable to recognise stolen products that are being transported among similar-looking goods.

On a tertiary level, sector policing initiatives focusing on crime hotspots close to the mining operations were supported. During the five-year period in the dataset, 74 off-site collaborative searches led to successful arrests (see Table 3.9).

5.3 CONCLUSION

The mining company that participated in the case study shared their experiences in formulating their crime prevention strategy, which was found to be integrated and comprehensive, using various crime prevention approaches on primary, secondary and tertiary level. Furthermore, “root cause” factors that may contribute towards crime at mining operations were considered in formulating the company’s crime prevention strategy, as well as crime displacement factors that may influence crime prevention measures. As the crime phenomenon is continuously changing, the participating mine identified the need to continually revise and update their crime prevention strategy in order to deal with this ever-changing threat.

Although not implemented (or practical) at all sites of the participating mine, the



participating mine utilised crime prevention measures with a situational, social and law enforcement approach on all three levels, namely primary (red), secondary (yellow) and

tertiary (green) as part of their crime prevention strategy (Figure 5.1).

Although this case study may contribute towards a better understanding of the factors and strategies to consider in formulating a holistic and integrated proactive approach to curbing asset theft at a South African mine, the study also resulted in some new research questions.

It became evident that formulating an integrated and holistic crime prevention strategy to address asset theft is not the only – or even the most important – challenge to achieving optimal crime prevention. The next step, namely implementation, also holds a

number of challenges. Budget limitations, identifying and utilising available resources optimally, adhering to company aligned objectives, proper training and recruitment of competent and trustworthy personnel, acquiring cost-effective security technology, and ensuring successful integration with technology already in use are but a few additional factors that should be considered.

Once the implementation process has commenced, continuous participation is necessary to ensure that the protocols that have been developed are enforced. These include maintenance and regular testing of security technology. Simultaneously, an evaluation process is required to determine whether crime threats have been addressed successfully and the envisaged security objectives have been achieved.

The evaluation process poses even more challenges, of which the most problematic is "How do you measure a prevented crime?". Interpreting recorded crime incidences accurately poses a further challenge: for example, if a security measure aimed at detecting irregularities is implemented, an increase in the number of incidents could be interpreted as successful detection but could also be interpreted as an unsuccessful deterrent.

In order to appraise the effectiveness of a crime prevention strategy holistically, one needs to ascertain how successes should be viewed and develop a comprehensive matrix to measure the outcome efficiently. The biggest challenge would however be incorporating the assessment of crime displacement and measuring diffused control benefits accurately.

In conclusion, during the researcher's journey to explore the research question for a period of five years at the participating mine, it became evident that managing a holistic and integrated crime prevention strategy to address asset theft is posing numerous challenges to the participating mine, as the security risk is ever-changing.

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Appendices

Annexure A: Interview questionnaire

Biographical data

Participant reference number: _____

Participant position: _____

Participant years' experience in security management: _____

Participant years' experience in the mining industry: _____

Interview questions

1 In your opinion, what threat does *crime* pose to the mining industry?

1.1 What do you think are the *causative factors* or general factors contributing towards crime in the mining industry?

| |
|---|
| 1.2 What do you think is the best and most effective way to deal with these factors? |
| |
| 1.3 In terms of your security role, how do you address these factors? |
| |
| 2 How would you describe <i>situational crime prevention</i> , including physical security such as target hardening, access control, surveillance, etc? |
| |
| 2.1 With regard to the <i>security measures</i> used by the mining sites to prevent theft, in your opinion: 2.1.1 Which security measures are most successful to prevent theft? |
| |
| 2.1.2 Which security measures are not successful to prevent theft? |
| |
| 2.2 How do you evaluate security measures in order to find the most effective preventive strategy? |
| |
| 2.3 In your opinion, what is the best preventive strategy to address theft at mining sites? |
| |
| 3.1 How would you describe <i>crime prevention through environmental design</i> (CPTED) principles, including natural surveillance, natural access control and territorial reinforcement? |
| |

| |
|---|
| 3.2 In your opinion, can CPTED enhance your current preventative strategy? Please explain your answer. |
| |
| 4.1 How would you describe <i>community-based crime prevention</i> principles, aiming at reducing the social, economic and environmental factors contributing to crime? |
| |
| 4.2 In your opinion, can community-based crime prevention enhance your current preventive strategy? Please explain your answer. |
| |
| 5.1 How would you describe <i>crime displacement</i> , referring to the theory that crime may be displaced when offenders shift their attention so that they may replace the prevented opportunity with another unlawful act? |
| |
| 5.2 How do you compensate for possible crime displacement in terms of your current preventive strategy? |
| |
| 6 What kind of information, do you believe, will be useful to assist you in developing the most viable strategy to prevent theft in the mining industry? |
| |

Annexure B: Crime incident questionnaire

| | | | | | | | | | | | | | |
|--|---|-----------------|------------------------|----------------|-----|-------------------------------|--|--------|---------|----------|-----|--------|-----|
| Reference number | | | Date of offence | | | | Time of offence | | | | | | |
| Day of week | | | | | | | | | | | | | |
| Monday | D1 | Tuesday | D2 | Wednesday | D3 | Thursday | D4 | Friday | D5 | Saturday | D6 | Sunday | D7 |
| Mining section | | | | | | | | | | | | | |
| BRPM | U11 | CORP | U20 | LPM | U31 | MOD | U32 | MOT | U33 | PMR | U41 | POL | U42 |
| PPL | U34 | RBMR | U43 | RPMA | U12 | RPMR | U13 | RPMU | U14 | TPM | U35 | WVS | U44 |
| Offence type | | | | | | | | | | | | | |
| Attempted theft | | C1 | Theft | | C2 | Housebreak | | C3 | Robbery | | | C4 | |
| Values involved (specify in rand) | | | | | | | | | | | | | |
| Value involved | | Value recovered | | Potential loss | | Production loss | | | | | | | |
| Detailed description of offence | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Method used | Description | | | | | Method used | Description | | | | | | |
| Cable - burned | Cable-related theft | | | | m1 | Removed - cable store | Removed from cable store | | | | m17 | | |
| Cable - cut | Cable-related theft | | | | m2 | Removed - cable yard | Removed from cable yard | | | | m18 | | |
| Cable - pulled | Cable-related theft | | | | m3 | Removed - locker | Removed from a company Locker | | | | m19 | | |
| Cable - short | Cable-related theft | | | | m4 | Removed - stores | Removed from company stores | | | | m20 | | |
| Concealed in bag | For example plastic bag/paper bag/sports bag, etc | | | | m5 | Removed - vehicle | Removed from a vehicle | | | | m21 | | |
| Concealed in container | For example bin | | | | m6 | Reported missing | Object was reported missing to security | | | | m22 | | |
| Concealed inside equipment | For example electric motor | | | | m7 | Robbery - forced from house | Forcefully removed property from person in a house | | | | m23 | | |
| Concealed on person | Object was hidden on person or in clothing | | | | m8 | Robbery - forced from person | Forcefully removed property from person on foot | | | | m24 | | |
| Fence - cut | Gained entry by cutting a fence | | | | m9 | Robbery - forced from vehicle | Forcefully removed property from person in a vehicle | | | | m25 | | |
| Fence - over | Gained entry by climbing over a fence | | | | m10 | Theft out of vehicle | Property stolen from an attended locked vehicle | | | | m26 | | |
| Fence - through existing hole | Gained entry through an existing hole in a fence | | | | m11 | Through - garage door | Gained entry through a garage gate/door | | | | m27 | | |
| Fence - under | Gained entry by crawling under a fence | | | | m12 | Through - lock | Gained entry by breaking open a locked entity | | | | m28 | | |

| | | | | | |
|-----------------------------------|--|-----|-----------------------------|---|-----|
| Found abandoned | Object was found abandoned | m13 | Through - roof | Gained entry through the roof | m29 |
| Hidden at house | Object was hidden at suspect's house/residence | m14 | Through - steel door / bars | Gained entry through a steel/security gate/door or burglar bars | m30 |
| Hidden in vehicle | Object was found hidden inside a vehicle | m15 | Through - wall | Gained entry through the wall | m31 |
| Hidden outside security perimeter | Object was found hidden outside fence/security perimeter | m16 | Through - window | Gained entry through a window/glass door | m32 |
| | | | Through - wooden door | Gained entry through a wooden gate/door | m33 |
| Property involved | Description | | Property involved | Description | |
| Cable - copper | Any type of copper cable/stripped copper cable | i1 | Laptop/ notebook | All types of mobile computers | i16 |
| Cable - electrical | Any type of electrical cable/cords | i2 | None | Failed attempt, no property taken | i17 |
| Cable - other | Any other type of cable (not specified) | i3 | Other property | Any other type of property (Not specified) | i18 |
| Cable - fencing | Any type of fencing cable (not corrugated iron) | i4 | Paint | Including all paint, painting products, thinners, etc | i19 |
| Cable - iron | Any type or corrugated iron or part (palisades/gates) | i5 | PC/parts | Any computer related equipment/property (not mobile) | i20 |
| Appliances | All TVs, DVD players, CD players, hi-fi's, etc | i6 | Petrol/diesel/oil | Any type of fuel or oil used for any type of engine | i21 |
| Camera | Any type of camera/digital recording (also surveillance) | i7 | Radio - company | Any type of security radio, two-way or part of radio (charger) | i22 |
| Cash | Money | i8 | Safety equipment | Hard hats, underground lamp, rescue packs, safety shoes, etc. | i23 |
| Cell phone | Cell phone or any part of cell phone | i9 | Solar panel | Any type of solar panel, battery or part of solar system | i24 |
| Clothing | Overalls, jackets, shirts, etc | i10 | Stationery | Paper, pens, pencils, etc | i25 |
| Consumables | Coffee, tea, sugar, milk, meat, etc | i11 | Steel pipes | Any type of steel pipe or part of steel pipe | i26 |
| Documents | Official company documents | i12 | Theft out of vehicle | Any property stolen out of a vehicle | i27 |
| Equipment | All types of equipment not safety related | i13 | Tools | Any spanners, screwdrivers, measuring tape etc. | i28 |
| Firearm | All types of firearms, pistols, revolvers, etc. | i14 | Vehicle | Vehicle belonging to company | i29 |
| Furniture | All beds, chairs, tables, etc | i15 | Wheels | Any type of tyres, part of tyres or wheels | i30 |

| Weapon / violence used | | Description | | | | Weapon / violence used | | Description | | | | | | | | | | | | | | |
|---|--|---|----------|---|----------|------------------------|----|--|-----------------------|------------------------|----------|-----------------------|----|------------|--|----|-------------|--|----|---------|--|----|
| Blunt object | | For example hardhat, shoes, hammer, etc | | | w1 | Knife | | | | | w9 | | | | | | | | | | | |
| Bottle | | Glass bottle/broken bottle | | | w2 | Open hand | | Slap someone with hand | | | w10 | | | | | | | | | | | |
| Explosives | | Used or threaten with explosive device | | | w3 | Panga | | | | | w11 | | | | | | | | | | | |
| Firearm | | Any type of firearm/rifle | | | w4 | Pushed | | Pushed someone | | | w12 | | | | | | | | | | | |
| Fist | | Hit someone with fist | | | w5 | Sharp object | | For example scissor, screwdriver, etc | | | w13 | | | | | | | | | | | |
| Foot | | Kicked someone | | | w6 | Stick | | Including any type of stick, pole, kerie, sjambok, etc | | | w14 | | | | | | | | | | | |
| Forehead | | Hit someone with forehead (head butt) | | | w7 | Stone | | | | | w15 | | | | | | | | | | | |
| Grabbed | | Grabbed someone | | | w8 | Verbal threats | | Threats of violence made | | | w16 | | | | | | | | | | | |
| Area/place where crime was committed or detected | | | | | | | | | | | | | | | | | | | | | | |
| Concentrators | | p1 | Declines | | p2 | Hostels | | p3 | Offices | | p4 | Plants | | p5 | | | | | | | | |
| Refineries | | p6 | Shafts | | p7 | Smelters | | p8 | General mine premises | | p9 | Outside mine premises | | p10 | | | | | | | | |
| Number of suspects arrested | | | | | | | | | | | | | | | | | | | | | | |
| Suspect No 1: Details | | | | | | | | | | | | | | | | | | | | | | |
| Gender | | Male | | g1 | Female | | g2 | Unknown | | g3 | | | | | | | | | | | | |
| Race | | African | | r1 | Coloured | | r2 | Foreign | | r3 | Indian | | r4 | White | | r5 | Unknown | | r6 | | | |
| Age | | 16 and under | | a1 | 17 to 20 | | a2 | 21 to 30 | | a3 | 31 to 40 | | a4 | 41 to 50 | | a5 | 51 and over | | a6 | Unknown | | a7 |
| Employee type | | Contractor | | e1 | Mine | | e2 | Non-mine | | e3 | Security | | e4 | Unemployed | | e5 | Unknown | | e6 | | | |
| Suspect No 1: Result | | | | | | | | | | | | | | | | | | | | | | |
| Deported | | o1 | | Guilty | | o2 | | Not guilty | | o3 | | Undetected | | o4 | | | | | | | | |
| Warned and released | | o5 | | Warrant of arrest | | o6 | | Withdrawn | | o7 | | Pending hearing | | o8 | | | | | | | | |
| Suspect No 1: Sentence (if guilty) | | | | | | | | | | | | | | | | | | | | | | |
| Fine of R500 or less | | s1 | | Imprisonment of less than 3 months | | | | s8 | | Deported | | s16 | | | | | | | | | | |
| Fine of R501 to R1,000 | | s2 | | Imprisonment of 3 to less than 6 months | | | | s9 | | Correctional services | | s17 | | | | | | | | | | |
| Fine of R1,001 to R2,000 | | s3 | | Imprisonment of 6 months to less than 12 months | | | | s10 | | Suspended fine | | s18 | | | | | | | | | | |
| Fine of R2,001 to R3,000 | | s4 | | Imprisonment of 1 to less than 2 years | | | | s11 | | Suspended imprisonment | | s19 | | | | | | | | | | |
| Fine of R3,001 to R4,000 | | s5 | | Imprisonment of 2 to less than 3 years | | | | s12 | | Warned and released | | s20 | | | | | | | | | | |
| Fine of R4,001 to R5,000 | | s6 | | Imprisonment of 3 to less than 4 years | | | | s13 | | Warrant of arrest | | s21 | | | | | | | | | | |
| Fine of more than R5,000 | | s7 | | Imprisonment of 4 to 5 years | | | | s14 | | Pending sentence | | s22 | | | | | | | | | | |
| | | | | Imprisonment of more than 5 years | | | | s15 | | | | | | | | | | | | | | |

Annexure C: Interview questionnaire biographic data

Matrix: Biographic data of participants interviewed during 2007

| Interview question | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 | Total |
|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|--------------|
| Years: security experience | 26 | 26 | 28 | 18 | 38 | 17 | 21 | 32 | 21 | 28 | 21 | 38 | 18 | 22 | 16 | 370 |
| Years: security management | 23 | 21 | 23 | 8 | 25 | 5 | 21 | 6 | 3 | 16 | 10 | 11 | 9 | 5 | 12 | 198 |
| Years: mining experience | 19 | 7 | 10 | 6 | 27 | 5 | 19 | 6 | 3 | 23 | 16 | 30 | 16 | 5 | 6 | 198 |
| Mining area | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 | Total |
| Mining sites | | 1 | 1 | 1 | | | | | | | 1 | 1 | 1 | 1 | | 7 |
| Process plants | | | | | | 1 | 1 | 1 | 1 | | | | | | | 4 |
| Senior management | 1 | | | | 1 | | | | | 1 | | | | | 1 | 4 |

Annexure D: Statistical tables

Table 1: Asset theft-related incidents recorded at the participating mine per year

| Category | Year | Number of incidents | Value involved | Value recovered | Loss to mine | Production loss | Total loss to mine |
|-------------------------|--------------|---------------------|-------------------|-------------------|------------------|------------------|--------------------|
| Copper related | 2006 | 648 | 2,208,465 | 1,328,383 | 880,082 | 3,153,600 | 4,033,682 |
| Copper related | 2007 | 761 | 4,660,320 | 2,179,114 | 2,481,206 | 800,000 | 3,281,206 |
| Copper related | 2008 | 525 | 2,846,008 | 1,769,249 | 1,076,758 | | 1,076,758 |
| Copper related | 2009 | 501 | 4,343,487 | 2,000,455 | 2,343,032 | 654,016 | 2,997,048 |
| Copper related | 2010 | 498 | 6,696,811 | 4,258,773 | 2,438,038 | | 2,438,038 |
| Copper related | Total | 2,933 | 20,755,090 | 11,535,975 | 9,219,115 | 4,607,616 | 13,826,731 |
| Property related | 2006 | 634 | 5,741,242 | 4,477,448 | 1,263,794 | | 1,263,794 |
| Property related | 2007 | 561 | 3,561,632 | 1,192,160 | 2,369,472 | | 2,369,472 |
| Property related | 2008 | 683 | 5,616,851 | 3,476,597 | 2,140,254 | | 2,140,254 |
| Property related | 2009 | 723 | 4,871,133 | 2,519,439 | 2,351,694 | | 2,351,694 |
| Property related | 2010 | 511 | 4,290,650 | 3,014,649 | 1,276,001 | | 1,276,001 |
| Property related | Total | 3,112 | 24,081,508 | 14,680,293 | 9,401,215 | | 9,401,215 |

Table 2: Asset theft-related incidents recorded at the participating mine per type

| Other property related: asset type | Total | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|--------------|-------------|-------------|-------------|-------------|-------------|
| Aluminium/corrugated iron/steel | 281 | 25 | 29 | 45 | 116 | 66 |
| Appliances | 58 | 9 | 11 | 13 | 14 | 11 |
| Batteries | 57 | 7 | 5 | 16 | 15 | 14 |
| Brass | 26 | 3 | 4 | 7 | 5 | 7 |
| Building material/furniture | 140 | 39 | 31 | 25 | 28 | 17 |
| Cable - electrical/other | 71 | 17 | 19 | 12 | 14 | 9 |
| Camera/radio | 115 | 21 | 24 | 31 | 24 | 15 |
| Cash | 35 | 5 | 14 | 9 | 4 | 3 |
| Cell phone | 220 | 55 | 47 | 38 | 51 | 29 |
| Clothing | 54 | 12 | 8 | 13 | 12 | 9 |
| Consumables | 190 | 30 | 42 | 35 | 43 | 40 |
| Equipment/tools | 1,130 | 268 | 216 | 241 | 233 | 172 |
| Housebreak - damage/locks | 44 | 13 | 9 | 8 | 8 | 6 |
| Laptop/computer/computer parts | 280 | 28 | 48 | 75 | 76 | 53 |
| Other | 22 | 6 | 2 | 5 | 7 | 2 |
| Paint | 178 | 44 | 21 | 51 | 37 | 25 |
| Petrol/diesel/oil | 59 | 7 | 6 | 22 | 15 | 9 |
| Safety equipment/medical supplies | 88 | 23 | 22 | 19 | 10 | 14 |
| Solar panel | 18 | 7 | 0 | 5 | 2 | 4 |
| Theft out of vehicle | 11 | 3 | 2 | 4 | 2 | 0 |
| Tyres | 16 | 8 | 0 | 4 | 3 | 1 |
| Vehicle/trailer | 19 | 4 | 1 | 5 | 4 | 5 |

Table 3: Other property-related incidents that occurred "on site" per area

| Type of place | Total | 2006 | 2007 | 2008 | 2009 | 2010 |
|---------------------------|-------|------|------|------|------|------|
| Business premises/offices | 113 | 18 | 23 | 28 | 29 | 15 |
| Mining operation | 2,043 | 463 | 340 | 436 | 470 | 334 |
| Concentrator | 285 | 20 | 54 | 79 | 80 | 52 |
| Smelter | 80 | 17 | 20 | 17 | 18 | 8 |
| Refinery | 36 | 3 | 12 | 4 | 5 | 12 |

Table 4: Other property-related incidents per type of detection or method used per area

| Detection or method used | Total | Business premises/offices | Hostel/residential village | Mining operation | Concentrator | Smelter | Refinery | Off site |
|----------------------------|-------|---------------------------|----------------------------|------------------|--------------|---------|----------|----------|
| Reported to security | 659 | 45 | 20 | 397 | 77 | 26 | 6 | 88 |
| Robbery | 91 | 4 | 6 | 16 | 4 | 0 | 0 | 61 |
| Housebreak | 265 | 39 | 45 | 106 | 11 | 1 | 2 | 61 |
| Through - lock/locker | 87 | 2 | 4 | 54 | 19 | 4 | 2 | 2 |
| Through - steel door/bars | 19 | 1 | 0 | 9 | 5 | 2 | 0 | 2 |
| Through - window | 10 | 0 | 1 | 6 | 0 | 0 | 0 | 3 |
| Removed - vehicle | 64 | 5 | 1 | 44 | 0 | 0 | 0 | 14 |
| Fence - cut, over or under | 32 | 0 | 3 | 22 | 7 | 0 | 0 | 0 |
| Cut and stolen | 37 | 1 | 5 | 24 | 5 | 1 | 0 | 1 |
| Alarm/camera | 16 | 0 | 0 | 5 | 11 | 0 | 0 | 0 |
| Off site/residence/SAPS | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| Vehicle search | 129 | 2 | 7 | 109 | 4 | 5 | 0 | 2 |
| Suspect search | 993 | 19 | 70 | 763 | 71 | 35 | 19 | 16 |
| Recovered by security | 663 | 16 | 58 | 463 | 72 | 7 | 7 | 40 |

Table 5: Copper-related incidents per type of area or place

| Type of place or area | Total | 2006 | 2007 | 2008 | 2009 | 2010 |
|----------------------------|-------|------|------|------|------|------|
| Access gate | 64 | 2 | 23 | 22 | 15 | 2 |
| Cable racks | 161 | 12 | 27 | 34 | 22 | 66 |
| Cable yards | 164 | 35 | 26 | 42 | 32 | 29 |
| Change house | 7 | 2 | | 1 | 2 | 2 |
| Concentrator | 46 | 1 | 12 | 15 | 14 | 4 |
| Hostel/residential village | 88 | 24 | 36 | 16 | 9 | 3 |
| Off site/outside perimeter | 32 | 2 | 7 | 15 | 6 | 2 |
| Office/store/workshop | 47 | 12 | 14 | 4 | 8 | 9 |
| Pump/fan/sub | 323 | 64 | 74 | 73 | 54 | 58 |
| Refinery | 9 | 4 | 2 | 1 | 1 | 1 |
| Salvage yard | 20 | 5 | 7 | 1 | 3 | 4 |
| Shaft | 1,422 | 416 | 422 | 156 | 235 | 193 |
| Smelter | 38 | 10 | 12 | 10 | | 6 |
| Surface | 239 | 25 | 40 | 74 | 38 | 62 |
| Underground | 156 | 22 | 30 | 31 | 41 | 32 |
| Waste dump | 117 | 12 | 29 | 30 | 21 | 25 |

Table 6: Identified offenders per race, gender and age

| Race | Gender | Age: 16 years and under | Age: 17 to 20 years | Age: 21 to 30 years | Age: 31 to 40 years | Age: 41 to 50 years | Age: 51 years and over | Age: unknown |
|----------|--------|-------------------------|---------------------|---------------------|---------------------|---------------------|------------------------|--------------|
| African | Female | 0 | 2 | 35 | 46 | 37 | 9 | 22 |
| African | Male | 6 | 53 | 758 | 647 | 503 | 198 | 192 |
| Coloured | Female | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Coloured | Male | 0 | 0 | 3 | 1 | 0 | 0 | 0 |
| Foreign | Male | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| White | Female | 0 | 0 | 7 | 3 | 0 | 2 | 0 |
| White | Male | 0 | 11 | 50 | 49 | 55 | 35 | 6 |

Table 7: Property-related incidents place or area per outcome

| Type of place | Not guilty | Pending | Recovery only | Resolved | Undetected | Warrant | Withdrawn |
|----------------------------|------------|---------|---------------|----------|------------|---------|-----------|
| Off site | 4 | 32 | 58 | 44 | 182 | 5 | 12 |
| Hostel/residential village | 11 | 13 | 64 | 51 | 59 | 10 | 10 |
| Business premises/offices | 2 | 6 | 14 | 28 | 59 | | 4 |
| Mining operation | 91 | 188 | 472 | 645 | 532 | 25 | 90 |
| Concentrator | 5 | 10 | 85 | 51 | 114 | 7 | 13 |
| Smelter | 2 | 1 | 6 | 38 | 26 | 0 | 7 |
| Refinery | 2 | | 8 | 17 | 7 | 1 | 1 |