

**THE ANALYSIS OF A CELL PHONE RECORD AS A SOURCE OF
INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE
THEFT**

by

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A Dissertation

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DECLARATION

I, Anna-Marie van Niekerk, student number 35879130, hereby declare that this dissertation, "The analysis of a cell phone record as a source of intelligence in the investigation of copper cable theft," is submitted in accordance with the requirements for the Magister Technologiae degree at Unisa, is my own original work, and has not previously been submitted to any other institution of higher learning. All sources cited or quoted in this research paper are indicated and acknowledged by means of a comprehensive list of references.

A handwritten signature in cursive script, appearing to read 'A. van Niekerk', written in dark ink on a light background. The signature is positioned above a horizontal dotted line.

Anna-Marie van Niekerk
26 February 2015

DEDICATION

I dedicate this research to the late Brigadier L.J.A. (Leon) Grobbelaar, who sadly passed away on 2014/01/29. Brigadier Grobbelaar was the former Station Commander of Worcester, South African Police Service (SAPS). It is due to his influence and exemplary leadership that I started to conduct this research.

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ABSTRACT

Copper cable theft (CCT) has a devastating effect on the South African economy, and essential services such as TELKOM, ESKOM AND TRANSNET have been seriously disrupted, due to CCT. This dissertation focuses on the value of the cell phone record as a source of intelligence during (CCT) investigations. The cell phone industry is growing each year, and millions of people worldwide possess a cell phone. Some of these people are involved in criminal activities – which mean that cell phones, with their advanced capabilities, hold evidence which relates to crime. The activation of cell phone activity is contained on a cell phone record, and, when analysed, such information becomes intelligence which has a positive impact on CCT investigations. The purpose of this study is to assist and give guidance to investigators, in order to analyse the cell phone record(s) of CCT thieves.

Key terms

Copper cable theft; criminal investigation; forensic investigation; forensic science; multidisciplinary approach of science; information; crime intelligence; crime intelligence cycle; cell phone record; cell phone analysis.

LANGUAGE EDITOR

23 February 2015

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LIST OF ABBREVIATIONS

BS	Base Station
BSC	Base Station Controller
BTS	Base Transceiver Station
CCT	Copper cable theft
Cell C	Cell C
CD	Compact Disc
CSIR	Council for Scientific and Industrial Research
DNA	Deoxyribonucleic acid
DVD	Digital Versatile Disc
ESKOM	Electricity Supply Commission
GPRS	General Packet Radio System: Internet Data Connection Stream
HLR	Home Location Register
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
KPMG	Klynveld Peat Marwick Goerdeler
MMS	Multimedia Messaging Service
MS	Mobile Station
MSC	Mobile Switching Centre
MSISDN	Mobile Subscriber Integrated Services Digital Network
MTN	Mobile Telephone Network
NFMCCC	Non-Ferrous Metals Crime Combating Committee
NFTCC	Non-Ferrous Theft Combatting Committee
PSTN	Public Switched Telephone Network
RICA	Regulation of Interception of Communication and Provision of Communication-Related Information
SABRIC	South African Banking Risk Information Centre
SACCI	South African Chamber of Commerce and Industry
SAPS	South African Police Service
SIM	Subscriber Identity Module
SMS	Short Message Service
TSU	Technical Support Unit

VLR	Visitor Location Register
Vodacom	Voice Data Communications

1. CHAPTER 1: GENERAL ORIENTATION

1.1 INTRODUCTION

Copper cable theft (CCT) in South Africa is a serious threat to the effective functioning of the country's infrastructure, and the nation expects its governing bodies to secure national assets, including telecommunications, electricity and transport. The former Minister of Energy, Dipuo Peters, stated at the government's infrastructure development meeting in Pretoria, on 18 August 2011, that CCT amounts to economic sabotage – which disrupts energy, transport and telecommunications service delivery. It impacts on living standards, and drives up the cost of goods and transport. It also disrupts operations, and inhibits job creation, exports and investment (*Make cable theft a serious crime...*, 2011:3). A valid example supporting her statement is the effect CCT is having on the Gautrain rail system. According to the South African Chamber of Commerce and Industry (SACCI), the annual cost of CCT is approximately between R15 and R18 million a month (*Make cable theft a serious crime...*, 2011:3).

1.2 PROBLEM STATEMENT

The researcher forms part of the Non-Ferrous Metals Crime Combating Committee (NFMCCC) within the Worcester cluster. The NFMCCC was established out of the previously-known Non-Ferrous Theft Combating Committee (NFTCC). The NFMCCC addresses copper cable theft with the relevant role players who are affected by CCT – such as Telkom, Transnet and Eskom. They are known as the parastatals or stakeholders. (A circular, with reference 2/28/23, dated 2011-02-23, explains the structure and mandate of the NFMCCC – **see** Annexure B).

During the monthly meetings of the NFMCCC, the researcher observed, over time, that police investigators (detectives) have refrained from using cell phone records as a source of intelligence in CCT investigation. This contributes negatively towards the quality of the investigations, the litigation process regarding CCT, and the successful prosecution of suspects. This observation led the researcher to conduct this research within the Worcester cluster.

The researcher's experience as an investigator led her to the conclusion that the conventional methods of collecting intelligence and evidence in CCT investigations do not yield the desired results. This is due to the time frames, terrain, and the locality in which these crimes are committed. It is also difficult to find eyewitnesses and physical evidence, due to the nature of the crime. Through experience, and preliminary research, the researcher knows that a suspect's cell phone leaves behind an invisible trace that can be detected through the analysis of cellular tower data. This data appears on the cell phone records provided by the service provider. Lochner and Zinn (2014:164) proved, by using the Lochner Principle, that the cell phone data of suspects can be isolated through computer programs.

To address this problem the researcher decided to focus her research (in the Worcester cluster) on the cell phone record as a source of intelligence during CCT investigations.

1.3 AIM OF THE RESEARCH

De Vos, Strydom, Fouché and Delport (2011:94) point out that the aim of research is something that one plans or does, and, according to Mills and Birks (2014:204), it forms the anchor point of the research. The aim of this research is to determine and demonstrate that the use of the information on a cell phone record can be used to formulate crime intelligence. A secondary aim is to determine the investigative value of this crime intelligence in solving CCT investigations.

1.4 PURPOSE OF THE RESEARCH

Denscombe (2002:29) emphasises that the purpose of research is something that needs to be understood concisely, precisely, and right from the beginning. According to Maxfield and Babbie (1995:70) and Singleton and Straits (2010:107), research is undertaken for three broad purposes: to explore, to describe, and to test relationships among variables. Denscombe (2002:27) adds, as an additional purpose, that of research empowerment. According to Babbie and Mouton (2011:80), De Vos et al (2011:95) and Singleton and Straits (2010:107), exploratory research is conducted in order to gain insight into a situation.

Based on what Babbie and Mouton (2011:85, 323), Denscombe (2002:27, 29), De Vos et al (2011:95), Maxfield and Babbie (1995:70), Mills and Birks (2014:204)

and Singleton and Straits (2010:107) have stated, the researcher considers the following to be the purposes of this research:

1.4.1 Exploratory

- To explore existing investigation methods, involving the cell phone record as a source of crime intelligence in CCT investigation.
- To explore the topic under investigation, by consulting national and international sources, in order to obtain new information on how cell phone records can be used as a source of crime intelligence in CCT investigation.
- To interpret the data, and make recommendations on how to utilise cell phone records as a source of crime intelligence in CCT investigation.

1.4.2 Empowerment

- The researcher empowered herself with the new knowledge obtained while conducting research on how cell phone records can be utilised as a source of crime intelligence in CCT investigation.
- The researcher can empower members at the NFMCCC meetings, by presenting training sessions promoting the cell phone record as a source of crime intelligence in CCT investigation.
- The researcher will empower those who are collaborating in the research, so that they can develop an understanding of the cell phone record as a source of crime intelligence in CCT investigation.
- To provide recommendations for good practice, that will empower investigators of CCT with effective investigation techniques to solve CCT investigations. The researcher can also empower members in the cluster, through training sessions at station level.

1.5 RESEARCH QUESTIONS UNDER INVESTIGATION

According to Bless, Smith and Kagee (2006:116), Hofstee (2006:132) and Leedy and Ormrod (2010:56), research questions can be an excellent way of collecting data, and can provide guidelines on how the researcher should analyse and interpret that data. De Vos et al (2011:352) advise the researcher to follow a logical sequence, and limit the number of research questions – which should be clear, focused and feasible. Denscombe (2002:31) points out that research

questions should specify exactly what is to be investigated. The researcher followed the advice of De Vos et al (2011:31) and Flick (2011:90), by limiting the research questions to only one – which will provide information on the identified problem.

The following research question was formulated:

“How can cell phone records be used as a source of intelligence in the investigation of copper cable theft (CCT)?”

1.6 KEY THEORETICAL CONCEPTS

According to Leedy and Ormrod (2005:119), the purpose of defining key concepts is to prevent any misunderstandings. Ruane (2005:51) mentions that the researcher should use the definitions that suit the research the best. The important concepts in this study are the following:

1.6.1 Investigation

Investigation is the systematic search for the truth, with the primary purpose of finding a positive solution to a crime, which is a concept developed over many years (Lochner, 2014:6, 7).

1.6.2 Forensic investigation

Forensic investigation is the application of science to solve matters resulting from crime, and to examine and analyse evidence (Van Rooyen, 2004:7).

1.6.3 Cell phone record

The cell phone record is the “total version of all the activities of the cell phone that have been registered by the network, which is reflected on the cell phone statement” (Lochner, 2007:68).

1.6.4 Crime intelligence

Intelligence is the end product of all the information that has been analysed (Clark, 2014: XIV).

1.6.5 Copper

Copper is defined as a reddish brown metallic element that is an excellent conductor of heat and electricity, and which is widely used for electrical wiring, water piping and corrosion-resistant parts, either pure, or in alloy form such as brass and bronze (Stein, 1967:322).

1.6.6 Copper cable

An insulated electrical conductor, often in strands or a combination of electrical conductors insulated from one another (Stein, 1967:206).

1.6.7 Theft

Theft is the unlawful appropriation of movable corporeal property belonging to another, with the intent to deprive the owner permanently of the property (Joubert, 2013:141).

1.7 VALUE OF THE RESEARCH

Denscombe (2002:43) and De Vos, Strydom, Fouché and Delport (2002:103) explain that the research must be able to be used for practical purposes, and it must be contributing to knowledge. This research can bring knowledge to the South African Police Service (SAPS), the South African economy, the role players affected by CCT, and also Unisa. The SAPS investigators can improve their investigation skills in CCT, by using cell phone records as a source of crime intelligence during investigation of this crime – of which the result can be a higher conviction rate. The recommendations of this research will expand investigators' knowledge in the use of cell phone records, and will serve as an investigative tool during CCT investigation. The results and recommendations can also serve as a guideline for the training of members on how to utilise cell phone records as a source of intelligence during these investigations.

The South African economy can benefit from this research as well, as it can lead to a decrease in the financial losses experienced by industry on an annual basis. The role players directly affected by CCT – for example, Eskom, Telkom and Transnet, can all benefit, as they can provide a more effective service delivery to

their clients, and experience a decrease in financial losses if less copper cable is stolen.

The academic community, and Unisa in particular, will find the research and its results valuable, as it can be incorporated into lecture material. This research can be made available to students in the Unisa library, and can serve as a reference source for future research. This research can also form the basis for new research within the field of cell phone records as a source of intelligence in different types of investigations.

1.8 RESEARCH DESIGN AND APPROACH

According to De Vos et al (2011:143) and Singleton and Straits (2010:111), research design is the collection and analysis of data. During this research, the researcher formulated her aims by following the advice of Mouton (1996:107), using the research design as guidelines and instructions during the research.

This study constitutes a phenomenological study since it explores the phenomena as experienced by the respondents from their world view perspective. According to Creswell (2013:69) phenomenological studies forms part of a qualitative research approach because in phenomenological studies the common meaning for several individuals of their lived experience of a concept or phenomenon are reported. Leedy and Ormrod (2010:135) mention that by following a qualitative approach, the researcher focuses on phenomena that occur in a natural setting – that is, in the “real world.” By following this approach, the researcher listened to respondents’ versions of the criminal investigation process in CCT – which were based on their experiences and ideas. Flick (2011:89) and Marshall and Rossman (2011:59) point out that qualitative research can also be conducted, because of the experience of the researcher in the field of CCT – which is the reason why this research was conducted.

According to Maxfield and Babbie (1995:4), empirical research is the production of knowledge, based on experience or observation. During this research, empirical data was obtained by getting out of the chair, going into the field and purposefully seeking out the necessary information – as stated by Denscombe (2002:6), through personal, face-to-face interviews with the respondents. The researcher

therefore combined the information obtained from respondents with the other primary and secondary data, to fill the gap which was identified during the literature study.

1.9 TARGET POPULATION

Welman and Kruger (1999:18) describe a population as follows: “a population encompasses the entire collection of cases (or units) about which we wish to make conclusions.” Melville and Goddard (2001:34) define a population as any group that is the subject of research interest. The population in this research will be all the detectives in the SAPS, who are involved in CCT investigation. Because of practical and financial reasons it was not possible to conduct interviews with all of them. The practical implications forced the researcher to select an accessible sub-population – which is called a target population. Maxfield and Babbie (1995:238) point out that a researcher may select a smaller group on the basis of his/her own knowledge of the population, nature of the research aims, and purpose. The researcher therefore decided to limit her study to 19 detectives who investigate CCT in the Worcester cluster, as the target population.

The researcher knows that the selected respondents are equipped, knowledgeable and experienced in the field of CCT investigation. This knowledge is based on the fact the researcher is a member of the NFMCCC in the Worcester SAPS cluster, and receives regular feedback on which detectives deal with these cases. The researcher decided to interview 19 detectives¹; this removed the necessity of drawing a sample.

1.10 DATA COLLECTION

Mouton (2001:14) explains that data collection involves the identification and selection of data sources for research. According to Flick (2011:119, 122), De Vos et al (2011:328, 341, 376) and Leedy and Ormrod (2010:146), documentation, observation, interviews, literature studies and case studies are all part of data collection methods. The data collection techniques for the purpose of this research

¹ During interviews some detectives did not answer questions

were interviews with the detectives, literature sources, documentation consisting of statistics on CCT, police circulars, and the personal experience of the researcher.

1.10.1 Literature

According to Bless et al (2006:24-25), De Vos et al (2011:302) and Mouton (2001:87), the literature review serves to do the following:

- Identify gaps in knowledge, and also weaknesses in previous studies.
- Ensure that the researcher does not duplicate the study.

The researcher found the research of Lochner (2007), “Kartering van selfoon-tegnologie” and the research of Pretorius (2012), “A criminological analysis of copper cable theft in Gauteng,” on Google. These research studies do not address the researcher’s topic as a whole. The dissertation of Lochner (2007) relates to cell phone technology and the mapping thereof, and not the cell phone record as a source of intelligence, whereas the research of Pretorius addresses the theft of copper cable in Gauteng. The researcher used the keywords to start with a widespread search on the Internet and the Unisa online library, by exploring available books, journal articles, theses and dissertations, and other articles and information related to the keywords.

According to Mouton (2001:88) the main types of information available are books, monographs, conference proceedings, reference materials, journal articles, newspapers, magazines, reports, theses and dissertations. The researcher has also made use of the bibliographies from literature sources to obtain more material on the research topic. During this research, the literature consisted of textbooks, journals and dissertations. The researcher made use of recent published literature to address the research questions, and to establish the current situation regarding the use of cell phone records as a source of intelligence. The researcher did not find any literature on the cell phone statement as a source of intelligence in CCT investigation.

1.10.2 Interviews

According to Bless et al (2006:117), interviewing is a process that provides data on understandings, opinions, what people remember doing, feelings, and the

things which people have in common. Semi-structured interviews were conducted with all the respondents. Leedy and Ormrod (2010:188) state that in a semi-structured interview the researcher will follow a standard questionnaire, but can ask individually tailored questions to obtain clarification or to probe a person's reasoning – which the researcher has done in this research. With the aid of semi-structured interviews, the researcher conducted in-depth research into the problem under investigation, and it allowed the researcher to be flexible in following interesting “avenues” that emerged in the interviews (De Vos et al, 2011:352).

The researcher made use of open-ended questions, to put respondents at their ease, and allow them to express themselves in their own words. This gave them a sense of control, and allowed them to answer questions on their own terms (Hofstee, 2006:122, 133).

- The questions in the interview schedule were clear, and addressed the research question. The interview schedule was assessed by the researcher's supervisor and co-supervisor, and the questions were found to be relevant. The interview schedule was also used as a pilot study during the first five interviews. During these interviews, certain questions were identified which were irrelevant to the research, and the researcher removed them from the interview schedule. The researcher followed the guidelines given by Leedy and Ormrod (2005:146-149) for conducting a productive interview, by making sure that interviewees were representative of the group. The researcher interviewed everyone in the target population group.
- Confidentiality: The respondents' names were not revealed. They received a code number so that only the researcher knows who the respondent is. They were labelled as respondents 1, 2, and so on, up to respondent 19. The interview schedules were kept in a safe at the researcher's home.
- The interviewer did not put words in the respondents' mouths, or influence their replies.
- The interviewer kept her reactions to herself during the interviews.
- The researcher focused on the factual, and asked realistic and relevant questions.

1.10.3 Documentation

Documents are “standardised artefacts, in so far as they typically occur in particular formats: as notes, case reports, contracts, drafts, death certificates, remark, diaries, statistics, annual reports, certificates, judgements, letters or expert opinions” (Flick, 2011:124). The researcher identified CCT investigations during which cell phone records were utilised, and looked into the investigation methods used. The researcher utilised the following secondary data documentation, as outlined in De Vos et al (2011:379): newspaper articles, monthly feedback statistics as discussed at the NFMCCC meetings, statistics relating to copper theft, obtained from the Internet, and internal circulars received from within the SAPS.

1.10.4 Personal experience

Creswell (2013:78-79) is of the opinion that a researcher can use his or her own experience in qualitative research as a data collection technique because past knowledge of the researcher must be engaged and used. Creswell (2013:78-79) furthermore refers to this as ‘bracketing’. As at 2014, the researcher is a warrant officer in the SAPS, and has twenty-one years of service in the organisation. Ten years were spent as a detective – eight of which were in the second-hand goods environment, which involved investigation in CCT. During this time as an investigator, she was also appointed to inspect scrap metal dealers, and to investigate their illegal activities. The researcher also attended several courses in the field of criminal investigation.

1.11 DATA ANALYSIS

De Vos et al (2011:381), Hofstee (2006:117), Leedy and Ormrod (2005:150) and Tesch (1990:142–145) all give guidelines for the analysing of data, and state that data must be turned into information by analysing it. Mouton (2001:108) explains analysing as “breaking up the data into manageable themes, patterns, trends and relationships.” The researcher made use of the spiral analysis method to analyse the data, as set out by Leedy and Ormrod (2005:15), who suggest the following steps:

- Organise data: The researcher organised the data by breaking it up into smaller text by using key concepts such as ‘forensic investigation’. The

researcher then filed the documentation in files under index cards, and in folders on the computer.

- Data was critically read, to ensure that the researcher understood the data and got a sense of the whole.
- General categories or themes were identified, as well as sub-categories or sub-themes. This allowed the researcher to obtain a better understanding of what the data meant, and what message(s) it conveyed.
- The data was integrated, summarised and computerised. The researcher wrote summaries of the different data items, using the obtained literature. Through this, the researcher identified themes and patterns in the data.

1.12 METHODS TAKEN TO ENSURE VALIDITY

Leedy and Ormrod (2013:104) highlight that several social researchers have invalidated the concern for reliability and validity as it 'arises only within the quantitative research tradition'. According to Creswell (2014:201) and Leedy and Ormrod (2013:105), terms such as 'dependability', 'conformability', 'verification', 'transferability', 'trustworthiness', 'authenticity', and 'credibility' are used to describe the idea of validity. Creswell (2014:201) however states that this can also be referred to as the 'qualitative validity' in a qualitative study. In reply to this Lichtman (2014:194) argues that these terms seems to be out dated and that they all refer to validity. Taking this into consideration the researcher will discuss the validity and reliability (point 1.13) aspects that are relevant to this research.

Validity is important, as it ensures that the research is not based on poor quality data and interpretations. According to Denscombe (2002:100), validity concerns the accuracy of the questions asked, the collected data, and the explanation offered. In general, it relates to the data and the analysis used in the research. Blaxter, Hughes and Tight (2001:221) add that validity has to do with whether one's methods, approaches and techniques actually relate to, or measure, the issues which have been explored. During the interviews and data analyses, it was clear that there was no confusion on the part of the respondents, in answering the questions.

1.12.1 Target population of respondents

The researcher chose all nineteen (19) detectives within the Worcester cluster, who were involved in CCT investigation. These nineteen (19) detectives were representative of the detectives in the cluster who investigated CCT, since everyone was included. There was, however, a high probability that they would also be representative of all detectives involved in CCT investigation, as they had all received training in investigation of crime, they were all appointed according to the South African Police Service Act 68 of 1995 (South Africa, 1995), they must all adhere to the Constitution of the Republic of South Africa, Act 108 of 1996 (South Africa, 1996) and the Criminal Procedure Act 51 of 1977 (South Africa, 1977), they must adhere to the same regulations, instructions and standing orders, and they are all non-commissioned officers. The researcher is familiar with this information, due to the sampling groups' biographical information in the interview schedule, as well as the fact that the researcher herself was a detective for ten years.

1.12.2 Literature

The researcher conducted an extensive literature search, in order to glean information from textbooks. All sources were cited, and recognition was given to authors in the body of the dissertation and in the list of references. Police dockets and circulars were deemed to be valid, since case numbers and references were cited for enquiries. Literature sources were quoted accurately, and facts were not distorted.

1.12.3 Interviews

The purpose of the interview was explained to the respondents (De Vos et al, 2011:350). The respondents' confidentiality was guaranteed, and each respondent received a code number which was kept in a safe at the researcher's home. The researcher conducted the interviews in a quiet location, to ensure that the respondents were not distracted – as advised by Leedy and Ormrod (2010:149). The interview schedule was based on the identified research problem, and addressed the respondents' experiences in the field of CCT investigations, their personal background and observations.

Answers were written down in the presence of respondents and were not manipulated. Respondents were not influenced during the interview, and the researcher did not pass any remarks regarding answers given by respondents. The researcher did not ask leading questions which could have compelled the respondents to answer in the way the researcher wanted. The interviews were conducted with colleagues of the rank of constable, sergeant and warrant officer. The researcher did not influence or manipulate the respondents, as this could result in a negative outcome for the research.

1.12.4 Data analysis

The researcher made use of approved and valid data analysis technique tested by other researchers. This ensured that research results would not be misleading.

1.13 METHODS TAKEN TO ENSURE RELIABILITY

“Reliability is the extent to which the observable (empirical) measures that represent a theoretical concept, are accurate and stable when used for the concept in several studies” (Bless et al, 2006:149). Blaxter et al (2001:221) are of the opinion that if another researcher were to look into the same questions in the same setting, they would come up with the same results (not necessarily an identical interpretation).

1.13.1 Target population of the respondents

The researcher chose all nineteen detectives within the cluster, because of their involvement in CCT. The use of all nineteen detectives who investigated CCT in the Worcester cluster provided that the information gathered was valid for those who were investigating this type of crime in the cluster.

1.13.2 Interviews

Semi-structured interviews were used for the respondents, mostly using open-ended questions. This did not restrict the researcher to asking only the questions on the interview schedule. The same interview schedule was used for interviewing all the respondents. Their confidentiality was guaranteed, and interviews were conducted in privacy. Their answers to the questions were documented on the interview schedule in their presence. The researcher did not ask leading

questions, or manipulate their answers. This will ensure that when different researchers conduct the same research with the same interview schedule, the same result will be obtained. The researcher drafted a letter for voluntary participation in the interview, for respondents.

1.13.3 Literature

The researcher guarded against the possibility of plagiarism during the research, as explained by Singleton and Straits (2010:49). Sources were cited in the body of the dissertation and in the list of references. Information obtained from Internet websites was suitably referenced. The original case dockets and crime statistics are available for any enquiries. Permission was granted by the SAPS to obtain information from the abovementioned documentation, for research purposes.

1.13.4 Data analysis

The researcher relied completely on the data obtained, and analysed the data using approved methods in qualitative research. Themes and patterns in the data were thus identified. The researcher made a list of the topics and key concepts relevant to this research. Those themes and data which belonged to the same category – for example, definitions of ‘key concepts’ and ‘literature’, were then grouped together to obtain a clear perspective of the data. This data was kept together in a file with index cards and the interview schedule.

1.14 ETHICAL CONSIDERATIONS

Research ethics places an emphasis on the human, and sensitive, treatment of research respondents, who may be placed at varying degrees of risk by research procedures. It is the responsibility of the researcher to ensure that the research is ethically conducted (Bless et al, 2006:140). The researcher ensured that her research was ethically conducted, by adhering to the ethical theories of De Vos et al (2011:115-127), Flick (2011:216) and Singleton and Straits (2010:51-63), as follows:

- Non-maleficence: Researchers should avoid harming respondents; the respondents were informed that they could stop the interview, if they did not

feel comfortable with the questions put to them. Their human and legal rights were therefore not violated.

- **Beneficence:** Research on human subjects should produce some positive and identifiable benefit, rather than simply be carried out for its own sake. The researcher carried out the research, in order to come to conclusions and findings which might contribute to the investigation methods for CCT, in the SAPS.
- **Autonomy or self-determination:** Research respondents' values and decisions were respected; no person was forced to take part in the research, and all of them were informed as to the nature of the research. The respondents' answers to the questions put to them were not manipulated, nor were their points of view questioned.
- **Justice:** All people should be treated equally. The researcher did not discriminate in terms of race, age, rank, gender, or salary income.
- **Informed consent:** The respondents were informed regarding the nature of the research, and their privacy was guaranteed. The researcher made use of the guidelines set out by Leedy and Ormrod (2010:102), and drafted a consent form which was signed by both the respondent and the researcher, before each interview.
- **Guaranteed confidentiality and anonymity:** Each respondent received a code number. None of the respondents gave any indication of withdrawing during the interview. Their anonymity was guaranteed in the pre-drafted consent letter. De Vos et al (2011:121) emphasises the privacy of respondents; thus, interview schedules, field notes and interpretations were kept in a safe in the researcher's study. Electronic data was password protected.
- **Deception:** The respondents were not misled in any way, and the researcher did not withhold any information from respondents. They were informed of the aims of the research, and what would be done with the outcome of the research.
- The researcher remained honest and objective during the research, all sources were cited, and data and documentation were available on request.

1.15 EXPLANATION OF WORDS/PHRASES

Table 1.1: Explanation of Words/Phrases

Custodians of records	Keeping of records in the ordinary course of business
Parastatals	An organisation having a certain amount of political authority, and serving the state indirectly – and who experience economic losses due to copper cable theft, e.g. Eskom and Telkom
Service providers	Organisations which provide cell phone contracts such as MTN, Vodacom and Cell C
Section 205 subpoena	This document is used when a magistrate, at the request of the public prosecutor, requires any person who may have material or relevant information regarding any crime, to appear before him/her to testify regarding the material or information

1.16 CHAPTER STRUCTURE

Chapter 1: This chapter provides a general orientation to the topic of the dissertation and the methodology used to investigate the topic.

Chapter 2: In this chapter, criminal investigation, forensic investigation and forensic science, as well as the aims of the investigator and the objectives of criminal investigation, are presented. The chapter includes an explanation of the collection of cell phone evidence as part of the objectives of criminal investigation. Further, the multidisciplinary approach of forensic investigation, and the role of science, is explained.

Chapter 3: In this chapter, the concepts ‘information’ and ‘intelligence’ are elaborated on. The chapter also discusses overt and covert information collection techniques. The crime intelligence cycle is clarified, and a practical example is given to describe and illustrate how the cell phone record forms part of the crime intelligence cycle.

Chapter 4: In this chapter, a brief overview is given of the history of the cell phone, its characteristics, and the cellular concept. The researcher explains in detail how the information on the cell phone record is analysed to become ‘intelligence’.

Chapter 5: In this chapter, the findings and recommendations of each chapter are discussed. Conclusions are drawn, based on the literature and the interviews, and recommendations are offered.

1.17 CONCLUSION

In this chapter, the researcher introduced the research study and discussed the problem, the research design and the methodology.

The researcher followed a reliable blueprint for this research, as suggested and described by literature, which leads to the interviews being reliable and valid. The researcher found sufficient literature to address the research question as well as the aims of the research. The analysis of the data was a helpful aid, in order to come to valid conclusions.

In the next chapter, Chapter 2, a literature review and a discussion where the empirical data will be presented and measured against the literature, covering topics such as criminal investigation, forensic investigation, and the multi-disciplinary approach of science.

2. CHAPTER 2: FORENSIC INVESTIGATION

2.1 INTRODUCTION

According to Birzer and Roberson (2011:6), "*crime exists in every human society. Social scientists call this phenomenon a 'cultural universal'. Crime is an inescapable truth of human existence as we know it*". The science of criminal investigation would not be developed until modern times. Television shows such as CSI (crime scene investigation) have greatly increased the public's awareness of the use of science in criminal and civil investigations. Unfortunately, these shows have created unrealistic expectations from forensic science and investigation skills within both the public and the legal community (Saferstein, 2013:4).

Investigators have to be trained both in investigation skills and in forensic science. In Newburn, Williamson and Wright (2007:396), the following question is raised: "*Is knowledge of forensic science a core competency of policing and investigation?*" They continue by stating that forensic science is central to the investigation of crime and other incidents.

Forensic science owes its origins, firstly, to the individuals who developed the principles and techniques needed to identify or compare physical evidence, and secondly, to those who recognised the need to merge these principles into a coherent discipline that could be practically applied to a criminal justice system which includes the investigation of crime (Saferstein, 2011:6). Osterburg and Ward (2010:5) state that the role and responsibilities of the criminal investigator have changed dramatically over the past ten years. They are of the opinion that criminal investigators are now more educated, trained, and knowledgeable about complex systems and social differences. According to Osterburg and Ward (2010:5), the changes are due to the result of changes in technology, media, the law, and forms of communication such as the Internet and cellular phones.

This chapter will focus on the 'investigation' part of the research question, and also give an explanation of criminal investigation, the objectives of criminal investigation, forensic investigation, forensic science, and how forensic science relates to both forensic and criminal investigation.

2.2 THE ART OF CRIMINAL INVESTIGATION

According to Tong, Bryant and Horvath (2009:7), there are competing perspectives regarding the nature of detective work, and they characterise criminal investigation with the words “art,” “craft” and “science.” The authors refer to the “craft” of criminal investigation as experience of the job, an understanding of the suspects, victims and police involved in the criminal investigation process, and the ability to craft and organise the case in a manner considered suitable by the detective. Tong et al (2009:7) refer to the “art” of detective work as both intuition and instinctive feelings regarding problem-solving. It is, however, important to discuss the skills and the aims of the person who will be responsible for the execution of the detective work.

2.2.1 The investigator

The SAPS is often in the media headlines, due to poor service delivery and criminal investigation, which, in turn, reflects negatively back to the investigator. From the researcher’s own experience, she realises that the investigator stands central to any investigation, and that the success of the investigation amongst others depends on the attitude, professionalism and work ethics of the investigator.

Birzer and Roberson (2011:14) are of the opinion that the investigator must have the skills in, and knowledge of, the following: criminal and procedural law, methods of interrogation, understanding a crime scene, developing a case for prosecution, understanding modus operandi, spotting patterns in criminal behaviour, and understanding the causes of criminality. The researcher knows, from her own experience, that these skills, as mentioned by Birzer and Roberson (2011:14) and Lochner (2014:9), are of the utmost importance for an investigation. The researcher also knows that the investigator cannot rely solely on these skills, and that there must be a balance between the mentioned skills and certain personality traits that an investigator must have (Lochner, 2014:8).

Bennett and Hess (2007:9, 11), Dutelle (2011:54) and McMahon (2001:5) point out that a good investigator needs to be knowledgeable, creative, patient, able to apply technical knowledge, self-disciplined, self-confident, objective and logical,

and remain open-minded. The researcher is in agreement with these authors, and knows how important the formulation of best practices is, in order to be an effective investigator who will be able to deliver the best possible docket for prosecution.

Dutelle (2011:51), Gilbert (2004: 38) and Tong et al (2009:38) believe that of the many personality traits of an investigator, a superior reasoning ability ranks near the top, as it can make or break a criminal investigation and the outcome of the investigation. The researcher knows, from experience, that superior reasoning can be very helpful – especially during the interviewing of suspects or witnesses, as well as during the presentation of evidence during a trial, or cross-examination, in court procedures.

2.2.2 Crime investigation as part of a reconstructive process

Casey (2011:16) mentions that the goal of crime investigation is to follow the leads that offenders leave during the commission of a crime, and to link perpetrators to the victims and crime scenes. Bennett and Hess (2007:6) describe crime investigation as a patient, step-by-step inquiry or observation, a careful examination, a recording of evidence, or a legal inquiry into the past events, which can be seen as part of the reconstructive process.

The viewpoints of Bennett and Hess (2007:6) and Green (2007:356) regarding criminal investigation, is that crime investigation is a reconstructive process that uses deductive reasoning – a logical process in which a conclusion follows from specific facts, to solve crimes. These authors further explain that, based on specific pieces of evidence, investigators establish proof that a suspect is guilty of an offence. Green (2007:356) alerts one to the fact that detectives, or other investigative personnel, need to take numerous factors into consideration when reconstructing past events. This is done, according to the researcher, to determine who committed the crime, and under what circumstances the crime was committed.

Lushbaugh and Weston (2009:4) also engage with the concept of reconstructing past events, and define criminal investigation as the lawful search for people and things which can be useful in reconstructing an illegal act or omission. They

emphasise that it is a probing from the known to the unknown, backward in time, to determine the truth. The authors are further of the opinion that to successfully reconstruct past events, investigations are based on accuracy, fidelity and sincerity in lawfully searching for the facts, and, equally, faithfulness, exactness, and probity in reporting the results.

The researcher observes that the explanations of Bennett and Hess (2007:6), Dutelle (2011:3), Gilbert (2010:34) and Lushbaugh and Weston (2009:4), for reconstructing past events, all include the words 'law' or 'legal'. This is a warning of the importance of reconstructing past events lawfully, as unlawful investigations have been the subject of numerous court decisions, and the cause of many accused individuals not having been found guilty.

2.2.3 Objective and subjective clues

Gilbert (2010:34), Osterburg and Ward (2010:1) and Van Rooyen (2004:4) state that the investigation of crime encompasses the collection of information, and the collection of objective and subjective evidence, in a logical procedure, for identifying, apprehending, and convicting suspected offenders, and to record past events.

Van Heerden (1982:182) explains subjective evidence as being evidence of people who are indirectly involved in the perpetration of crime, which reflects the personal opinions and feelings of these people – for example victims, and eyewitnesses. He further explains objective (physical) evidence as being factual proof, and items that can be observed and measured, and refers to objective traces as physical evidence.

The investigator is responsible for the collection of objective and subjective clues during criminal investigations. To collect these clues the investigator has certain aims to fulfil certain objectives of crime investigation. The aims of the investigator will be discussed in the following paragraph.

2.3 AIMS OF THE INVESTIGATOR

According to Du Preez (as cited in Van der Westhuizen, 1996:4), an aim is an exact description of a duty which has to be completed within a specific time frame,

and according to a specific guideline. The aims of the investigator during the investigation of a crime are listed by Bennett and Hess (2007:6), Brown (2001:3), Dempsey (2003:29), Gilbert (1993:36), Lyman (2002:14), Van der Westhuizen (1996:4-7) and Van Rooyen (2001:54) as the following:

- To follow up leads: This is the gathering of information that will be presented to the court to make a finding, and includes subjective and objective evidence.
- Identification of a crime: The investigator must determine what crime was committed.
- Individualisation of the suspect or perpetrator: This is done through information collected, and links the crime to a specific person.
- Tracing of witnesses: The investigator has to trace and find witnesses who can give testimony in court against the perpetrator.
- Arrest of a suspect: When there is *prima facie* evidence to link the suspect with the crime, the suspect must be arrested.
- Retrieval of stolen goods: This is done to reduce the victim's losses, and to present the recovered property as evidence in court.
- Involvement in the prosecution process: The investigator has to assist the prosecutor during court procedures – for example, be available on the day of trial, ensure that witnesses, the accused and exhibits are available, and the necessary fees paid to witnesses and expert witnesses, and also ensure that the disposal of exhibits is paid for.

The investigator has to put down specific guidelines for him/herself, in order to complete tasks successfully. The investigator must therefore also be familiar with the objectives of criminal investigation.

2.4 OBJECTIVES OF CRIMINAL INVESTIGATION

According to Becker (2009:12), Bennett and Hess (2007:5), Birzer and Roberson (2011:28), Dutelle (2011:6), Horgan (1979:9) and Osterburg and Ward (2010:5-6), the objectives of criminal investigation are –

- to determine if a crime has been committed
- to collect evidence

- to identify the perpetrator
- to present the best possible case to the prosecutor

These objectives will be discussed in detail in paragraphs 2.4.1 to 2.4.5

Bennett and Hess (2007:8), Gilbert (2010:49) and Grau (1981:10) are of the opinion that the objective of criminal investigation is to solve cases in a legal manner. Horgan (1979:1) is of the opinion that a competent investigator is one who employs sound fundamental practices and objectives. Newburn (2008:438) is of the opinion that investigation has two basic objectives, namely –

- the generation of knowledge in relation to the investigation
- the production of evidence

2.4.1 To determine whether a crime has been committed

Siegel (2011:13) points out that for a criminal investigation to take place, the crime must come to the attention of the police – and then a sequence of steps begins. Gilbert (2010:52) and Osterburg and Ward (2010:6) state that to determine whether a crime has been committed, necessitates an understanding of criminal law and the elements of each criminal act. They advise investigators to have copies of case law in their possession, and are also of the opinion that knowledge of the law of evidence and procedure is of paramount importance to the investigator.

Gilbert (2010:52) advises law-enforcement officers to be aware of what actions constitute various criminal acts. The crime investigator has to establish whether a crime was, in fact, committed, and, if committed, what crime. Marais (1992:2-8) emphasises that when a police official identifies a crime incorrectly, it can send the investigation in a wrong direction, which can result in the loss of important evidence. In the Vanderbijlpark Crime Administration System (CAS) 1445/05/2000, the deceased was murdered somewhere else and then left in the road near Vanderbijlpark, to make it look like a hit-and-run accident. Another practical example is when a man is murdered in a house, and that house is then set on fire to conceal the murder.

2.4.2 Collection of evidence

Gilbert (2010:52) explains that evidence serves two different, very important functions, and refers to inculpatory evidence and exculpatory evidence. The author describes exculpatory evidence as evidence which exonerates or clears a person of blame or legal guilt, and inculpatory evidence as incriminating evidence, for it tends to establish guilt.

Bowen (2010:58) and Ogle (2004:20) and Byrd (2004:1) state that the collection of evidence begins at the crime scene. The Locard principle states that whenever two objects come into contact, there is a mutual exchange of material between them. This is the starting point from which physical evidence will be collected, to be analysed for the purpose of evidence. Lochner, Benson and Horn (2012:50) argue that the information on a cell phone record, which is used to reconstruct past events, can be seen as physical evidence, because it meets all the criteria of physical evidence. In cell phone investigations the mapping of the signal can be used as evidence.

Lochner et al (2012:50) and Lochner and Zinn (2014:160) explain that the proof of the signal will be found in the electronic database of the cell phone service providers' computer database, which is kept at a remote location. Lochner registered the Lochner principle as a trademark (2006/00362 and 2006/00367), in terms of section 29 (2) of the Trade Marks Act 194 of 1993 (South Africa, 1993). This principle entails the following [translation from Afrikaans]: "... in order to reveal invisible technological traces left at a crime scene by mapping them through telecommunication techniques, and to render, on a scientific and technological basis, a technological service to examine a crime scene, with the aim of making the invisible trace visible" (Lochner & Zinn, 2014:171).

Gilbert (2004:57-58) points out that an investigator must have the capability to recognise evidence, and to establish whether it will be legally admissible in a criminal trial. Van Rooyen (2008:57) points out that evidence collected in a manner that violates any law or right of the accused person must be excluded if the admission of that evidence would render the trial unfair, or otherwise be detrimental to the administration of justice.

Bowen (2010:58) explains that once the commission of a crime occurs, investigators, crime scene investigators or technicians report to the scene, to document, collect and preserve evidence for analysis. Fisher (2004:55) and Van Heerden (1982:212) caution investigators, and draw attention to the fact, that great care should be taken when evidence is collected. This will prevent contamination, and ensure that the integrity of the evidence remains intact. Dutelle (2011:225) urges investigators not to drink, smoke, or do anything at the crime scene that might compromise the scene, as valuable evidence can be present. These viewpoints correlate with Lochner and Zinn (2014:30-31), who list the conditions that can cause contamination as evidence which is handled without protective clothing, weather conditions, and uncontrolled activities at the scene. The researcher knows, from experience, that weather conditions such as rain and wind can have a negative impact on crime scenes, as important exhibits can be destroyed. Girard (2011:17) points out that the packaging used for evidence depends on the evidence itself, and that the package must protect and preserve the evidence.

Bertino (2009:4), however, explicitly states that a trained investigator will collect all available evidence without making judgments about its potential importance, and he makes it clear that knowing which evidence is of significance requires the ability to recreate the series of events preceding the crime.

According to Birzer and Roberson (2011:91), the manner in which evidence is collected varies with the specific type of evidence being recovered. Bowen (2010:61), Dutelle (2011:22), Gilbert (2004:105), Girard (2011:19) and Van Heerden (1982:212) state that being able to account for the collection and possession of evidence is known as the chain of custody, and whenever a break in the chain of custody occurs, the item will most probably not be admitted as evidence in court.

2.4.2.1 The collection of evidence with regard to cell phones

Cell phone technology and cell phone records have grown in importance in criminal investigation, as people come to rely increasingly on their cell phones for conducting business and personnel activities (Dutelle, 2011:389). The cell phone record can provide the criminal investigator with information on past events,

because the activities of a cell phone are stored and, for billing purposes, produced on a cell phone record (Marshall, 2008:116).

The collection of cell phone evidence starts with a Section 205 subpoena, which is issued in terms of the Criminal Procedure Act and served on the cell phone service provider's Technical Support Unit (TSU), and the investigating officer has to follow the chain of evidence during the gathering of the cell phone evidence. When the cell phone record is obtained from the Technical Support Unit, the record must be downloaded onto a DVD, and handed in to the SAP 13 (SAPS exhibit store). The cell phone record must be filed in the case docket under clip A².

In the case of musician Taliep Petersen, the cell phone records of the accused, Najwa Petersen, were used to reconstruct past events. In his judgement, the presiding judge stated that the cell phone records afforded compelling corroboration of the state's case and what transpired before Petersen was murdered (Schmitz, Riley & Dryden, 2009).

Cell phone records were also utilised in the investigation of Patrick Maqubela, an acting judge who was murdered by his wife, Thandi, and a co-accused. During the trial, the cell phone records of the deceased and his wife, especially with regard to cell phone towers, were used to cross-examine the accused (Nel, 2013:10).

2.4.3 The recovery of stolen property

Osterburg and Ward (2010:7) underline the importance of description and identification of stolen property during an investigation, as it can later be critical in establishing ownership. Van der Westhuizen (1996:4) points out that the recovered stolen property is to be presented as evidence in court, and is also of the opinion that the recovery of stolen property is to minimise the loss suffered by the victim.

The viewpoint of Lochner (2014:10) is that an investigator must, at all times, try to trace stolen property. The author bases his argument on the fact that it can be used as evidence in court, and is adamant that investigators should guard against

² The SAPS case docket is divided into clips A, B and C

not searching for stolen property if they are of the opinion that enough evidence has already been found and seized. According to Horgan (1979:11), the recovery of stolen property can be accomplished by using interviews with suspects and witnesses, and through legal searches. Horgan (1979:11) proposes the following places that can be visited to carry out legal searches:

- Pawn shops
- Second-hand stores
- Scrap yards
- Known receivers of stolen property

From the researcher's experience as a second-hand dealer's coordinator, she knows that stolen copper cable can be searched for at licenced scrapyard dealers, and that stolen copper cable leaves South Africa via the harbours. The researcher's experience is supported by Pretorius (2012:41), who is of the opinion that stolen copper from South Africa is shipped to Eastern European countries from the harbours at Cape Town and Durban. Further, on 9 November 2011, two containers of copper cable and aluminium, bound for Korea, were seized in Table Bay Harbour (*Copper cable seized ...*, 2011).

2.4.4 To identify the perpetrator

Dowling (1997:2) and Osterburg and Ward (2010:8) state that the primary objective of criminal investigation is to identify the perpetrator. The authors then warn that the ability to bring a suspect to justice depends on the evidence necessary for conviction. According to Horgan (1979:9) and O'Hara and O'Hara (2003:14), the criminal is identified in one of the following ways: confession, eyewitness testimony, possession of stolen property, examination of physical evidence, modus operandi, or circumstantial evidence. Van der Westhuizen (1996:7) sees the identification of the perpetrator as the link between the crime and the facts collected during the investigation.

2.4.5 To present the best possible case to the prosecutor

The final objective of investigation is prosecution (Ngomane, 2010:26). Horgan (1979:11) believes that the case docket which contains the evidence submitted to

the prosecutor should be so comprehensive that a person without any knowledge of the case would completely understand the contents of the case docket.

The investigator collects information, and the state prosecutor presents collected evidence, to prove in court that the suspect is guilty beyond a reasonable doubt. O'Hara and O'Hara (2003:16) stress that the final step of a criminal investigation is the presentation of evidence in court. The presentation completes the process of proof, if the elements of the offence have been proved. To deliver a well-prepared copper cable case docket to the state prosecutor, the elements of theft must be proved. The elements of theft are defined in Joubert (2013: 141) and Snyman (2002:469) as the unlawful and intentional appropriation of another's movable property, with the intent to deprive the owner permanently of the property. Copper cable is movable property, and a copper cable thief removes the cable permanently.

The respondents described the objectives of criminal investigation as follows:

According to fifteen (15) of the nineteen (19) respondents³, the objectives of criminal investigation are –

- the taking down of witness statements
- the arrest of suspects
- to bring the suspect before court

Seven (7) of the same fifteen (15) respondents are of the opinion that the objectives of criminal investigation are –

- the analysing of exhibits
- to visit the crime scene
- to testify themselves as investigators during court procedures. (This is also listed by researchers as an objective of criminal investigation).

³ Four of the respondents did not answer the question

Two (2) of the fifteen (15) respondents mentioned the search for the truth as an objective of criminal investigation.

Respondent 9, a constable with nine years' detective experience, and who has undergone a detective course, mentioned that according to him, the objective of crime investigation is that crime investigation should be professionally done – which is not listed by crime researchers as an objective.

It is interesting that fifteen (15) of the respondents listed the taking down of witness statements as an objective of criminal investigation, and seven (7) mentioned the visit to the crime scene as an objective of criminal investigation. This is in the opinion of the researcher due to the fact that the visit to the crime scene is compulsory, and the taking down of witness statements is a daily task for them.

2.5 FORENSIC INVESTIGATION

According to Van Rooyen (2008:14), the term 'forensic investigation' has become a buzzword used by many people directly or indirectly involved in investigation. Benson, Horne and Jones (as cited in Zinn and Dintwe, 2015: 18) mention that the term 'forensic investigation' is the cause of much confusion and debate in the investigation environment; however, they include the concept and idea of investigation conducted by the corporate and private investigation sectors, as part of forensic investigation.

According to Van Rooyen (2008:14), forensic investigation is usually associated with the investigation of computer-related crimes, which include corruption, fraud, embezzlement and/or other white-collar crimes. Van Rooyen (2008:87) emphasises that forensic investigations must have meaningful and well-defined objectives, be properly and lawfully executed, and be fair and impartial, and the results be accurately documented and communicated.

Jackson and Jackson (2004:1) explain 'forensic investigation' as the use of any scientific method for the resolution of criminal cases, which mainly includes the recovery and analysis of physical evidence that is crucial to the success of the subsequent investigation. Lambrechts (2014:27) states that if a "science" is used

in criminal investigation, or anything else for that matter, then it is forensic investigation; if not, it is merely an investigation, with no unintelligible adjectives attached to it.

According to Van Heerden (1985:7-9), the use of science in the investigation of crime not only refers to the use of natural science, but also includes the methods and techniques used by the investigator to investigate crime. These can be seen as the use of social science, because it can include, and requires, specific skills that are recognised in social science – for example, interpersonal relations, interviewing, investigatory skills, psychology, and being able to deal with different types of people and character traits. It appears as if Van Rooyen (2008:14) associates forensic investigation with computer crime and white-collar crimes. His description of forensic investigation is not in line with that of the other three authors. It could possibly be that the definition of forensic investigation has many dimensions.

The researcher agrees with Jackson and Jackson (2004:1), Lambrechts (2014:27) and Van Heerden (1985:709), and will explain by means of an example: When tool mark comparisons are done during a copper cable theft (CCT) investigation, the comparison part of the investigation constitutes forensic analysis of the evidence, because the analyst will make use of scientific methods to do the comparisons. The methods and techniques used by the investigator to recover copper cable can be the result of the investigatory skills possessed by the investigator. A scientific method could also have been used to interview the suspect, which might have led to the recovery of the stolen copper cable.

Another example is during an assault investigation with one eyewitness. Such an investigation can also be regarded as a forensic investigation. There may not have been any scientific analysis of exhibits, but that is not to say that the investigation process was not done according to social science principles. This would include the social science dynamics of interviewing, testifying, and special methods and techniques used to obtain the witness's statement.

On the question of what forensic investigation entails, the research group had different explanations for the term:

Eight (8) of the respondents explained forensic investigation as a more detailed investigation which is to be done by more advanced techniques and technology, while six (6) respondents described forensic investigation as the utilisation of science during a criminal investigation. Five (5) respondents were of the opinion that it is the gathering and analysing of evidence for criminal investigation. The respondents had different viewpoints of the concept 'forensic investigation', as eight (8) respondents mentioned that forensic investigation is the utilisation of more advanced techniques and technology, six (6) respondents mentioned that forensic investigation is when science is utilised during criminal investigation, and five (5) respondents were of the opinion that when evidence is analysed during criminal investigation, it is then forensic investigation.

2.5.1 Science, knowledge and education as components in analysing evidence

The word 'science' derives from the Latin noun *scientia*, meaning 'knowledge' (Bosman, 2006:20). Jacobs (2011: x) defines science as a branch of knowledge dealing with theory and facts derived from observation and research, and showing general laws that affect judicial verdicts and sentencing. Houck and Siegel (2011:4) regard science as the collection of systematic methodologies used to increasingly understand the physical world. Further, Karagiozis and Sgaglio (2005:9) state that the core of every forensic investigation relies on the painstaking recognition, identification and individualisation of physical evidence, so that the scientist can offer an expert opinion on the nature and relevance of the evidence in question.

According to Dutelle (2011:4-6), forensic science is the analysis of physical evidence by using the latest in scientific instrumentation, knowledge and education within the natural sciences. Scientists will have a relevant degree in their field of expertise or in another applied field of science. Dutelle (2011:6) continues it is not the duty of the scientist to determine guilt or innocence, or to otherwise investigate the crime. The obligation of the scientist is the proper interpretation of the submitted evidence, and the provision of a report on such matters to the detective for final determination on the investigative value of the evidence.

Newburn et al (2007:386) argue that forensic scientists not only require knowledge of their scientific discipline, but also of criminal law and procedure, together with reasoning skills to evaluate the evidence in the light of the specific case findings, as well as the communications skills to present the evidence in court. They emphasise that equating scientific expertise with forensic science expertise, is misleading.

Lyman (2013:8) highlights that a scientific method consists of the collection of data through observation and experimentation – which leads to new knowledge and allows the integration of previous knowledge. The researcher recognises the fact that natural science is not the only science involved in the investigation of crime but, due to page limitations, the role of social science will not be discussed, and the research will focus on the involvement of natural science in crime investigation.

The researcher is of the opinion that the analysis of a cell phone record forms part of forensic investigation, as the cell phone record has to be observed and analysed, and new knowledge and information is gathered from the cell phone record. The researcher also agrees with Newburn et al (2007:386), regarding the importance of knowledge of the Criminal Procedure Act when the cell phone record is analysed. The analyst must also be able to present the findings in a criminal court.

2.6 THE USE OF FORENSIC SCIENCE IN THE INVESTIGATION OF CRIME

According to Bizer and Roberson (2011:6), the use of forensic science in criminal investigation has developed through the years. This is also the viewpoint of Bowen (2010:57), who states that forensic science is a historical science applied to criminal investigation and legal matters. Fraser and Williams (2009:11) are of the opinion that the development and use of new technology in forensic investigation arises through commercial or academic routes, and draws on the universal and international knowledge bases of science.

Fraser and Williams (2009:11) further refer to the use of both natural science and social science, when they suggest that forensic science can be used during forensic investigations, to clarify the sequence of events, identify critical facts,

provide elimination factors, assist interview strategies or crime scene examination strategies, and prioritise and assist lines of enquiry.

An example of how forensic (natural) science was used in investigation was in the Griekwastad trial, where Captain Joubert testified on the scientific analysis of blood spatter analysis at the crime scene. The blood spatters at this crime scene refuted the accused's version of what happened at the crime scene.

Bowen (2010:60) believes that because science is repeatable and testable, it is a useful part of investigation. This is also what Tong et al (2009:38) have in mind, and they state that the use of science in investigation is posited as inquisitorial in nature, seeking after the truth, emphasising evidence and promoting hypothesis testing. Seventeen (17) of the respondents described forensic science as the seizure of physical evidence at a crime scene, and the analysis of that physical evidence to link a suspect (or suspects) to a crime scene. Six (6) of the seventeen (17) respondents added that it is to ensure a conviction in court. Two (2) respondents could not answer the question. Both of these respondents were constables with less than ten (10) years' detective experience, and at the time of the interviews they had not attended the detective learning programme course.

Not one of the detectives mentioned that forensic investigation includes the concept of social science. The researcher knows, from her field of experience as a police official, that the term 'forensics' in the investigation environment refers to concepts such as the analysis of physical evidence, fingerprints, ballistics and photography. The researcher is of the opinion that the detectives were not aware of the developments within the broader forensic investigation field.

2.6.1 The relationship between forensic science and its application in the law

Wecht and Rago (2006:3) see forensic science and the law as independent from each other, and they state: "forensic science and law, law and science!" The authors then raise the question by asking what exactly the relationship is between the two concepts, and they conclude that there is a cutting-edge relationship between science and the law. To demonstrate this relationship, Fisher, Tilstone

and Woytowicz (2009:1) briefly explain forensic science by stating that it has several meanings, one of which pertains to courts of judicature.

Brown and Davenport (2012:7) and Saferstein (2013:2) also elaborate on the relationship between forensic science and the law, and explain forensic science as the application of science to law. Yacine and Fellag (2012: ii) statement of Forensic Sciences is in line with Brown and Davenport (2012:7) and Saferstein (2013:2), and they add the word 'broad' to the discussion. According to them, forensic science is the application of a broad spectrum of science to answer questions of interest to a legal system, which, according to the researcher, is a reference to the law.

Tilstone, Savage and Clark (2006:1) argue from a different viewpoint, and believe that forensic science is the application of scientific techniques and principles to provide evidence to related investigations and determinations, and they omit reference to courts and the law. Birzer and Roberson (2011:100) and Jacobs (2011:7) give a more comprehensive explanation of the use of forensic science and its application to law, and they include the words 'natural' and 'physical sciences' to law.

Fisher et al (2009:3), Gilbert (2010:15) and Houck and Siegel (2011:4) draw attention to the fact that 'criminalistics' is a synonym for 'forensic science' – an apt term for the profession of scientists, whose work answers questions for the courts through reports and testimony. Fraser and Williams (2009:1) believe that forensic science adds value to the courts, by providing scientific evidence which has been analysed by professional scientists.

The crux of forensic investigation is explained, when the relationship between forensic science and the law is highlighted by Karagiozis and Sgaglio (2005:8), as they include the words 'civil issues' and 'any matter'. These authors are of the opinion that the term 'forensic science' is used to refer to any matter which has relevance to a criminal or civil issue before court. This is a clear indication that forensic investigation is not limited to what scientists in a forensic laboratory do, but the authors are, however, adamant that the matter should be brought before a court.

Fisher et al (2009:1) support Karagiozis and Sgaglio (2005:8), and add the word 'administrative' to their viewpoint on forensic science and the law. Their argument is that forensic science is the application of scientific knowledge to assist courts in resolving disputes, whether civil, criminal or administrative. The relationship between forensic science and the law is best described by Fraser and Williams (2009:8) and Houck and Siegel (2011:4), who declare that forensic science aims to serve the common interest of establishing the 'truth' by means of those people who are involved in the criminal and civil justice processes.

2.6.1.1 Forensic scientific analysis and the law

Palmiotto (2013:119) emphasises that crime laboratories contribute to the criminal investigation process, as physical evidence is analysed in laboratories, and laboratories provide factual data and evidence, based on scientific principles, that will be used in court. This is in line with Swanson, Chamelin, Territo and Taylor (2011:205), who describe the mission of a laboratory as an institution that makes a contribution to the criminal justice system by seeking for the truth through the scientific analysis of physical evidence.

2.6.1.2 The use of forensic science in a multidisciplinary investigation approach

Brown and Davenport (2012:6-7) maintain that forensic science can be used as a multifaceted discipline investigation, which will draw on various scientific subject areas such as history, language, technology and reasoning skills. It will use the most current technology and equipment to provide a descriptive and complete analysis of evidence that was recovered and seized during the multifaceted investigation.

The researcher asked Lt.-Col. Johan Kok (2014) from the forensic laboratory in Platteklouf, about the various facets of science employed by the laboratory to carry out forensic analysis, and he indicated that the laboratory uses biochemistry, chemistry and physics. Birzer and Roberson (2011: 100), Jacobs (2011: 18, 19) and Saferstein (2013:2) describe the use of 'forensic science', in a multifaceted investigation, as an umbrella term encompassing a myriad of professions (natural and social science) which apply their skills to aid law enforcement officials in

conducting their investigations. It seems, according to the abovementioned authors, that forensic science is not only restricted to analysts in laboratories.

The diversity of professions which practise forensic science is illustrated by the eleven sections of the American Academy of Forensic Science. These include the following: criminalistics (which are practitioners – and it includes detectives), the digital and multimedia sciences, engineering science, jurisprudence, odontology, pathology/biology, physical anthropology, psychiatry/behavioural science, questioned documents and toxicology (Saferstein, 2013:2).

The researcher has learnt, from carrying out this research and from experience in the SAPS, that there are other forensic services which can also be utilised, which do not fall under the forensic science laboratory. This includes forensic toxicology, which studies, for example, the effect which alcohol has on the human body, during a drunken driving investigation. Due to page restrictions, not all the aspects of forensics will be discussed.

The researcher is cognisant, from experience, that the SAPS have a unit which specialises in the analysing of cell phone data, and which does not form part of the forensic laboratory. The cell phone analysis is used as part of a multifaceted investigation. This was seen in the Oscar Pistorius trial (Boskop – CAS 110/02/2013), when Capt. Francois Moller testified on cell phone data he had analysed on the handsets of the deceased, Reeva Steenkamp, as well as on those of the accused, Oscar Pistorius.

There are also private organisations, such as the Council of Scientific and Industrial Research (CSIR), KPMG⁴ and the South African Banking Risk Information Centre (SABRIC), which are involved in cell phone analysis to assist in investigations. This was seen during the Taliep Pietersen and Shrien Dewani trials, when Dr Schmitz, from the CSIR, gave testimony on cell phone evidence.

Figure 2.1 illustrates the multidisciplinary facet to the use of different scientific methods and disciplines during an investigation. The researcher has learnt, from

⁴ This is an audit company whose services include the analysing of cell phone records

experience that it is not always possible to involve all the disciplines in one investigation, because of certain factors such as the type of crime that was committed, the availability of experts, and also distances and weather conditions. However, there are various examples of how certain aspects of the multifaceted disciplinary approach in the use of forensic science, is applied by the SAPS and other investigation authorities.

Criminal cases in the media, where the multidisciplinary facet of science during the investigation of crime was utilised, include the following:

- During the Brett Kebble murder investigation (Norwood CAS 603/09/2005), cell phone technology, bullet shell casings, projectiles and gunshot residue left by the suspects at the crime scene, were used to determine the exact point where the shooting took place (Figure 2.1, number 11).
- In the Inge Lotz investigation (Cloeteville CAS 92/03/2005), evidence such as fingerprints, a shoeprint and an indentation in the deceased's skull, were utilised during the investigation process (Lochner & Zinn, 2014:171) (Figure 2.1, numbers 10 and 17).



Figure 2.1: Multidisciplinary facet of forensic science. (**Source:** Own source).

2.7 CONCLUSION

This chapter has illustrated that the methodology in criminal and forensic investigation has evolved over the years into more sophisticated methods to investigate and solve crime. It was also explained, by means of practical examples that forensic investigation consists of the use of both social and natural science, with the emphasis on natural science. It was also argued that forensic investigation uses science to analyse evidence, and that it can be used to litigate civil or criminal matters. The concepts 'forensic investigation' and 'forensic science' were discussed as terms which developed through the years, and that both the concepts have important contributions to make in criminal investigation. The cell phone record forms part of the multidisciplinary facet approach of forensic science, and can be used as evidence in the investigation of crime. The following chapter will discuss the cell phone record as a source of intelligence during the investigation of copper cable theft.

3. CHAPTER 3: INTELLIGENCE

3.1 INTRODUCTION

Criminal intelligence is the end product of a process whereby information is collected and processed in a systematic manner, in an attempt to find and generate evidence. Information gathered during an investigation can be used as crime intelligence and as evidence during a trial. Another advantage of crime intelligence gathering is the fact that it can open and indicate new areas and avenues of investigation.

This chapter discusses and explains what information and crime intelligence is, and it also focuses on the techniques used to collect information. The various steps in the crime intelligence process are also discussed, with a practical example of how the cell phone record can be used as part of the intelligence-gathering process. As part of the discussion where information can be found, a crime scene and the cell phone record are elaborated on. The final section in this chapter addresses the research question: how a cell phone record can be used as a source of intelligence.

3.2 INFORMATION

According to Lyman (2013:116), information gathering is a regular part of a police officer's daily responsibilities. Van Rooyen (2008:17) refers to information as knowledge that has been acquired through observation, experience or word of mouth, and which can assist the investigator directly or indirectly in the reconstruction of crime scenes, tracing of suspects, recovery of missing property or identification of witnesses. This corroborates what Respondent 10 of the sample group said, namely that information is "to have knowledge of a criminal incident or activity." The other respondents' explanations of information are as follows:

Fourteen (14) respondents stated that information is anything that can link a suspect to a crime, or that can help solve a crime – such as fingerprints, footprints, deoxyribonucleic acid (DNA) and witnesses.

The rest of the sample gave the following explanations of information:

- Data which is not yet processed, which can help to solve a crime.
- Anything about a crime, or people who can assist with the investigation of a crime.
- Physical or oral evidence.

Gottschalk (2010:113) emphasises that the core process of policing and law enforcement is investigation, and information is the lifeblood of an investigation. This is in line with Gilbert (2010:132), who underlines the fact that information is absolutely essential to the investigative process, and that information has always been the structural framework upon which the investigation is built. Steenberg (2008:27) and Van Rooyen (2008:17) are of the opinion that information can best be described as unevaluated and unprocessed raw material information or data. This is in line with what Respondent 17 said, describing information as unprocessed data. This respondent is one of the most senior of the empirical research group. Casey (2011:42) describes information, in the context of digital evidence, as data and programs that are stored on – and transmitted by – using a computer.

Ratcliffe (2008:96) refers to information as data which can produce meaningful evidence during an investigation. One of the respondents referred to information as “unproven evidence.” He explained unproven evidence as being facts that need to be investigated to determine the value and relevance thereof. Bell (2002:194) defines information as all sources from which evidence is processed – for example, reports, rumours and observations. This concurs with Steenberg (2008:14), which also describe information as unevaluated material of every description. Steenberg (2008:14) mentions that unevaluated information can be transformed into intelligence by means of evaluation, confirmation and interpretation. This includes unevaluated information derived from surveillance, reports, electronic stored data and photographs. For the purposes of this research, it is important to explain the meaning of electronic data. Electronic data is defined in the Electronic Communication and Transactions Act No. 25 of 2002 (South Africa, 2002a) as the electronic representation of information in any format.

The interview schedule did not include the question of information collection techniques, but during the interviews the importance of information collection

techniques was reflected in the total sample, and needs to be explored and reported on. The entire sample gave an indication that they make use of people – for example, witnesses and informers, as a source of information during copper cable theft. The different information collection techniques that can be used to collect information are elaborated on, below.

3.2.1 Information collection techniques

Lyman (2013:116) identifies overt and covert collection as techniques that can be used to collect and gather information:

3.2.1.1 Overt collection

According to Respondent 17, a synonym for overt information is ‘open information’, which, according to him, is publically available, and one does not have to subpoena any institution to make it available. The researcher gathers, from this research and her experience that a cell phone record can only be obtained via a section 205 subpoena, in terms of the Criminal Procedure Act (South Africa, 1977), during a copper cable theft investigation, and can therefore not be regarded as information that is publically available.

Lyman (2013:116) refers to the investigation of case files as an overt information collection technique, as it contains information which can lead to the identification and conviction of the suspect. Lyman (2013:116) advises police officials to document all criminal activity during crime prevention activities and investigations, and to report such activity to crime intelligence officials and detectives, as this forms part of overt collection. According to the researcher’s experience and knowledge, this information, in the SAPS investigation context, is documented and filed in the police case docket SAP3M.

Commercial databases hold vast amounts of economic data that are available at a subscription fee to the database, and can therefore also be seen as overt information (Birzer & Roberson, 2011:87, Clark, 2014:17, Lyman, 2013:116).

According to Gilbert (2010:133) overt information collection can also be obtained from the following sources:

- Newspapers, magazines, radio, television and computer-based information.
- Interviews with people who are witnesses to crimes.
- Victims of crimes, or suspects.
- Fellow law enforcement officers, including police officials, traffic officials and members of the Department of Correctional Services.
- Observations made by investigators during their preliminary survey of the crime scene.

It is strongly argued by Clark (2014:17) that investigators should make use of overt information collection in a process of searching for – and identifying of – information from available sources. According to Clark (2014:17), this is done to produce intelligence, and he also points out that law enforcement makes increasing use of open sources. The reason for this, according to him, is because overt information is available at low cost, is unclassified, and requires no special protection.

3.2.1.2 Covert collection

Clark (2014: XV) explains that covert information is highly secretive. It is possible that the criminal can be aware that information is gathered on his acts, but the source of the information – for example an informer, will remain unidentified. Lyman (2013:117) states that covert collection is the collection of data on criminal acts (in the planning phase, by the criminal) which have not yet occurred. Lyman (2013:117) describes intelligence files as closed files which have to be maintained apart from criminal investigation files, to prevent inspection of data.

The researcher knows from experience, and from this research, that the cell phone records of suspects are obtained from the service provider via a subpoena in terms of section 205 of the Criminal Procedure Act, after the crime has been committed, and, in some instances, before a crime is committed, and that this information is filed in case dockets.

From the viewpoint of Lyman (2013:117), it can be argued that if the cell phone record is filed in intelligence files, it can be regarded as covert information. The researcher will argue that this makes the cell phone record a covert source of information. However, when the information in the case docket is made available

in term of case law, as seen in *Shabalala v The Attorney-General of Transvaal and Another* 1995 (2) SACR 761 (CC), the cell phone record will then be an open source of information because it is now in the public domain.

Clark (2014: 17) and Gilbert (2010:151) state that covert information collection can be obtained as follows:

- Physical or direct surveillance, by foot, car, aeroplane, satellite or static positions.
- Electronic or intrusive surveillance, the listening in on spoken interactions via devices that amplify and gather sound, or monitoring of electronic communication.
- Informants.
- Undercover agents.

Schmalleger (2005:300) points out the importance of overt and/or covert information gathering by police, and mentions that studies have found that the one factor which most likely leads to arrest in crimes is the availability of information that was gathered.

The researcher is of the opinion that the cell phone record is a covert collection technique because it is not publically available, as a subpoena in terms of Section 205 of the Criminal Procedure Act has to be obtained, and served on the service provider. Although confidentiality during any investigation process is of the utmost importance, as stated by Clark (2014:XV), the information on a cell phone record is, according to Schmitz (2014), vital, in order to identify and link suspects with one another and with the crime and the crime scene.

3.3 SOURCES OF INFORMATION

Zinn (2010:30) mentions the fact that, internationally, crime information is obtained by the police through interviews, interrogation, questionnaires, and/or interviews with incarcerated, sentenced inmates.

According to Gilbert (2010:52) and Osterburg and Ward (2010:21), in order to determine the truth, the criminal investigation revolves around the collection of

information which will be admissible as evidence in court. Gilbert (2012:52), and Osterburg and Ward (2010:21) mention that sources of information can be classified into four distinct groups:

- Information from persons such as witnesses, informants, custodians of records and colleagues, and other law enforcement officers such as traffic officials.
- Information from documents such as business and financial institution records, information from cell phone companies, law enforcement agencies, and government-level, provincial and municipal records.
- Information obtained physically, such as evidence at crime scenes, and sketches and photographs of crime scenes.
- Information obtained electronically, such as data that is manipulated, stored or communicated by any man-made device, computer or computer system, or transmitted over a communication system.

Lochner et al (2012:150) and Lochner and Zinn (2014:171) have found that a cell phone leaves information on a crime scene, no matter whether the handset is used or not. The only requirement is that the cell phone should be switched on. According to these authors, this information, which they argue as being physical evidence, is recorded on the cell phone record. According to the abovementioned facts, the cell phone record falls under the group of information obtained from documents, information obtained electronically and custodians of records. The cell phone record of an accused will be made available by the service provider for investigation purposes and evidence, if the cell phone was switched on, or used to make or receive a call, or used to send a short multimedia message (SMS) when a crime was committed. The cell phone record should, however, be subpoenaed in terms of section 205 of the Criminal Procedure Act before it is made available.

With these facts in mind, as well as the focus of the study, the researcher will only discuss the cell phone record and the crime scene, as sources of information which can be processed into intelligence.

3.3.1 Explanation of a crime scene

Lochner and Zinn (2015:58) describe a crime scene as a place where investigators can gather physical evidence which may help them to reconstruct

past events. The crime scene can be the place where the crime was committed, where the crime was planned, routes to and from the crime scene, as well as where stolen goods were disposed of. The crime can be committed indoors or outdoors, in a vehicle, a building, or a docking place for boats. In the case of copper cable theft, the crime scene can be the pylons, the place where the crime was planned or executed, or where the stolen copper was loaded onto a vehicle, sold or discovered. It can also include the harbour, if the stolen copper was shipped out of South Africa.

Van Rooyen (2001:23) defines a crime scene as any locality or place where hidden clues can be found which can lead the criminal investigation in a direction towards clarifying or resolving the crime. Van Heerden (1985:217) describes a crime scene in a more scientific manner, by stating that a crime scene is a field laboratory where objects can be seized for laboratory tests.

3.3.2 The crime scene as a source of information

If one takes both the Locard and Lochner principles into consideration, there will be physical evidence left at a crime scene, by the perpetrator. These two principles both refer to physical evidence as 'traces'. The Locard principle mentions that when two objects came into contact with one another, the one leaves a trace on the other. From Locard's viewpoint, and the time era (1928) when this principle was formulated, one can safely argue that Locard referred to physical evidence. In a discussion of Lochner's principle (formulated in 2006), Lochner and Zinn (2014:164) are of the opinion that the greatest attribute of physical evidence is that it can link a suspect with a crime scene. The researcher is of the opinion that Lochner and Zinn (2014:165) refer to the modern era of electronic information in their discussion of the Lochner principle; therefore, the researcher looked into other literature on electronic information.

Krige (2013:24) mentions that electronic information which comes from a criminal activity often comprises a major part of the crime scene. The viewpoint of Casey (2011:46) and Papadopoulos and Snail (2012:315) is that many of our modern daily actions leave a trail of digits, and that all cell phone service providers keep some information about their customers. With these facts, as well as the argument

of Lochner and Zinn (2014:164) in mind, one can argue that there will be electronic information, in the form of digits, at a crime scene.

Marais and Van Rooyen (1990:29) state that traces and clues are usually left at crime scenes by perpetrators. The authors state further that the absence of traces and clues does not mean that they are not present at the crime scene. Forensic Fact File (2013:2-3) also mentions that there will be physical evidence at a crime scene, and alerts one to the fact that the crime scene is a valuable source of information, and investigators need to be on the lookout for physical evidence, and be aware of its evidential value.

In deduction to what they see as important information during copper cable theft investigation, the sample replied that the investigator should be on the lookout for the following physical evidence:

- DNA of the suspect – for example, blood on pillars⁵ and wires (see photo 3.1 where DNA can be found)
- Cigarette butts and drinking vessels (for example, empty tins)
- Fingerprints on touched items
- Shoeprints
- Foot imprints inside shoes left at a crime scene
- Tyre marks that can be compared with the tyres of suspects' vehicles
- Tool mark comparisons (see photo 3.2)

Forensic Fact File (2013:2-3) gives a wider explanation of the physical evidence which is left on copper cable theft crime scenes. From her experience as an investigator, and the facts mentioned by Forensic Fact File (2013:2-3), the researcher realised that the respondents did not mention all the physical evidence which can be found and utilised during copper cable theft investigations. The researcher knows, from her experience, that the cell phone record can also be an important source of information in this regard. When an accused activates a cell

⁵ While stealing copper cable, injuries can occur which can leave DNA on the scene – blood, for example

phone during the commission of a crime, such activation was generated on the crime scene, but the cell phone evidence will be kept on a database of the relevant service provider, at another geographical location.

Lochner and Zinn (2014:160), who explain that such information, can be presented visually in court, through mapping. When an accused activates a cell phone during the commission of a crime, such activation was generated on the crime scene. Such cell phone evidence will be kept on a database of the relevant service provider, at another geographical location, as mentioned above. Forensic Fact File (2013:2-3) states that the following information can be found on a copper cable theft crime scene:

- Fibres from the suspect's clothes.
- Paint from the vehicle used. Look out for paint on tree trunks, rocks and fence poles where the vehicle may have collided with, or scraped against, these objects.
- Soil clinging to suspects' shoes, vehicle, or copper cable found with the suspect, which can be compared with the soil at the crime scene.
- Loose buttons from the suspects' clothes, dropped at the crime scene.
- Cords and ropes left behind at the crime scene that may be linked to similar items found with the suspect.
- Chemical comparison of copper, found in the suspect's possession, with various control samples from the crime scene.
- The insulation material used to insulate copper cable can be used to perform physical matches.
- The length of cable that has been reported as stolen must be determined. It can then be compared with the length of cable recovered from the suspects.
- Copper is stolen from Eskom's high voltage transformers, which are filled with oil that has a specific composition. When suspects' clothes are recovered, they can be examined to determine whether transformer oil is present.

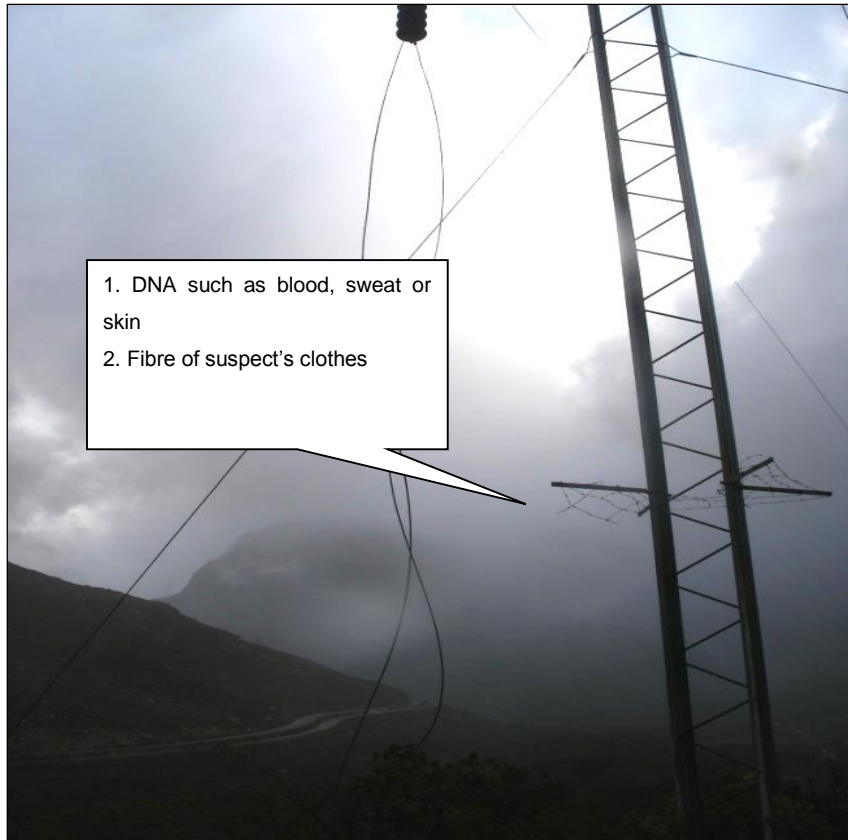


Figure 3.1: Photo of copper cable theft in Rawsonville (CAS 105/09/2011). Source: Own source.

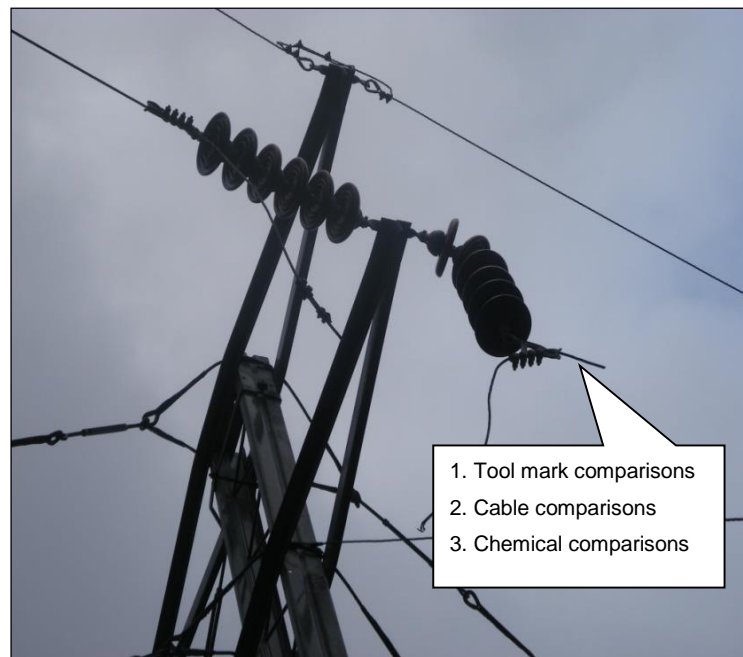


Figure 3.2: Photo of copper cable theft in Rawsonville (CAS 105/09/2011). Source: Own source.

3.3.3 The cell phone record as a source of information

A cell phone record is a document of a person's incoming and outgoing calls, maintained by a cell phone service provider (Get-Cell-Phone-Records, 2013). Lochner's (2007:68) and Lochner and Zinn's (2014:162) definition of a cell phone record is the total version of the call data records which were logged through the network.

The researcher asked Doctor Schmitz (2014) of the Council for Scientific and Industrial Research (CSIR) to give an explanation of a cell phone record, as he is regarded as the leading South African scientific expert in the analysis of cell phone records.

He has testified in several high profile investigations involving his field of expertise. Doctor Schmitz's viewpoint is as follows:

A cellular telephone record is a cellular telephone activity that has been recorded by a service provider for billing purposes. The secondary usage is the use of this record for forensic purposes.

The respondents were asked what information appears on a cell phone record. Twelve (12) of the respondents replied by giving the most basic information which appears on a cell phone record. According to them it is a document which indicates the following:

- Cell numbers of incoming and outgoing calls
- Date and time of calls made and received
- Date and time of short multimedia messages (SMS) made and received
- Names of base stations

The analysing of cell phone records is part of the researcher's key performance areas. The researcher has analysed numerous cell phone records, and therefore knows that a cell phone record has more information on it than that mentioned by the respondents. The researcher is of the opinion that the reason why the respondents are not that familiar with the cell phone record, lies in their background and the lack of training in cell phone analysis. In addition, it is a time-

consuming investigation process, and it is a well-documented fact that detectives are carrying up to one hundred dockets each, and do not have time to analyse the cell phone records.

By keeping the term 'forensic purposes' in mind, as mentioned by Doctor Schmitz, the researcher will continue with a discussion on the technology involved in generating the cell phone record, the information which appears on the cell phone record, and its value during the investigation process (see section 4.4 in Chapter 4).

3.3.3.1 How the cell phone record is generated and the information that appears on the cell phone record

Gilbert (2010:141) and Kriegler and Kruger (2002:595) point out that a documentary source is any type of information of a printed nature, or data otherwise recorded and stored, to be retrieved. According to Krige (2013:25), the ordinary meaning of the word 'document' is wide enough to include computer printouts. This was evident in *S v Harper* 1981 (I) SA 88 (D) 96C-F, *S v De Villiers* 1993 (I) SACR 574 (Nm) and *S v Ndiki* 2008 (s) SACR 252 (CK). In addition to that which was reported in the decided cases, Krige (2013:26) explains that the electronic system records and stores information by means of its software, and that the reliability of the printout does not depend on the credibility of a person, but on the credibility of the computer.

The information which appears on the cell phone record is generated by a computer, and the activity can only take place through a cell phone signal (Lochner et al, 2012:13). Lochner and Zinn (2014:168) explain that when the service provider is summonsed in term of section 205 of the Criminal Procedure Act, the information (computer printout) is provided to the SAPS.

The researcher knows, from her experience as investigator and from information provided by Lochner and Zinn (2014:162), that the cell phone record is an electronic document that contains information which syndicates the use of the handset (which will be the IMEI number) or SIM (subscriber identity module) card, and consists of columns which provides information about the following:

- MSIDN (Mobile Subscriber Integrated Services Digital Network) numbers of other users.
- Date and time of calls.
- Date and time of short multimedia messages (SMS messages).
- Name of base stations.
- IMEI (International Mobile Equipment Identity) numbers.
- IMSI (International Mobile Subscriber Identity) numbers.
- ICC-ID (International Chip Card ID).
- General Packet Radio System (GPRS) Internet data connection stream.

The researcher will also argue, from her experience in analysing cell phone records, that each service provider's cell phone records has different formats, and with experience gained by analysing cell phone records, the analyser will become familiar with the different formats.

When the cell phone records of a suspect or suspects who were involved in copper cable theft are analysed and processed, the information on the cell phone records become intelligence, because, according to Steenberg (2008:4), intelligence is information that has been analysed and processed. With this in mind, the researcher will explain how the cell phone record forms part of the crime intelligence gathering process.

3.4 CRIME INTELLIGENCE GATHERING PROCESS

Gilbert (2010:259), Hess and Orthman (2009:260), Ratcliffe (2008:92) and Steenberg (2008:4) are of the opinion that crime intelligence is a product resulting from information which was analysed, processed and evaluated. By keeping this in mind, it seems as if, although information is available on a cell phone record, it is not yet intelligence, but when the investigator starts analysing and processing the information on the cell phone record (for example, analysing other cell phone numbers on the cell phone record), it becomes intelligence. It is important, therefore, to continue, during this research, with a discussion on crime intelligence and the crime intelligence gathering process. The crime intelligence gathering process is a helpful process which helps investigators both to ensure that the

information is turned into intelligence, and to prepare evidence for the prosecution process.

3.4.1 Crime intelligence

[Crime] intelligence is defined, from a South African crime perspective, in section 1 (vii) of the National Strategic Intelligence Act 39 of 1994 (South Africa, 1994) either as intelligence used in the prevention of crime, or to conduct investigations and prepare evidence for the purposes of law enforcement and the prosecution of offenders. Milne (2013:3) further states that the main purpose of crime intelligence is to disrupt activities of criminals, and to reduce and investigate crime.

Lyman (2013:118), Ratcliffe (2004:4), Steenberg (2008:2), and Tonry and Morris (1997:364) refer to the following three main types of intelligence:

- **Strategic intelligence:** This is necessary for national strategic planning and decision-making (for example, an assessment of crime committed by illegal immigrants).
- **Operational intelligence:** This gains information on the specific activities of suspects, which is necessary for planning and decision-making of operations, which, according to the researcher, will include the investigation of crime. Ratcliffe (2004:4) sees operational intelligence as applied intelligence, and mentions that this form of intelligence is relevant when evidence is available on a suspect.
- **Tactical intelligence:** This is very specific to criminal activity, and targets criminal acts which are of immediate importance to the investigator – such as where they live, their whereabouts, or what vehicle they drive.

When analysing the main types of intelligence, the researcher can state with authority that the cell phone record forms part of operational intelligence. The record can provide information on, for example, the movements of the suspect during a specific time of the day. This is of importance for the planning of operations against copper cable thieves. In the investigation environment, the cell phone record of a suspect can provide important information which can be processed to form intelligence on the activities of the suspects – which can include communication between suspects, as well as their geographical whereabouts.

During the application process for a section 205 subpoena, in terms of the Criminal Procedure Act, the researcher experienced that the state prosecutors are strict, and will not approve the application if there is not sufficient relevant evidence available on such a suspect's involvement in the crime. However, when the cell phone record is received and analysed, the information on the cell phone record becomes intelligence, and can then be used in the investigation of the crime, and which may result in the identification and arrest of other possible suspects.

In practice, the information on the cell phone record, which is processed and analysed into intelligence and evidence, is integrated with the already known evidence, to strengthen evidence and the prima facie value of the evidence. This is also the opinion of Lyman (2011:117-118), who states that the analysis and integration of activities will include the knowledge of criminal activities of the past, present and future. Lyman (2011:117-118) is further of the opinion that this is the rationale whereon proactive crime investigations and crime investigation decisions are done and based.

The respondents were asked to describe the term 'crime intelligence'. Thirteen (13) of the sample described crime intelligence by including the word 'information'; however, they did not mention that intelligence is derived from information which has been processed.

Crime intelligence was also described by seven (7) respondents from the sample, as follows:

- Four (4) of the nineteen (19) respondents stated that crime intelligence is the gathering of information, and analysing of crime patterns, before and after a crime. The researcher knows, from experience, that crime pattern analysis is the knowledge of past, present and future criminal activities, while information is knowledge which has been acquired through observation, experience or word of mouth, and has not been analysed.
- Three (3) of the nineteen (3) respondents stated that crime intelligence is the gathering of information, over a period of time, on syndicates, by crime intelligence members or units.

The researcher concludes that the research group is not that familiar with what crime intelligence is, compared with the given literature. Although a part of the sample included the word 'information' in their explanation of crime intelligence, only four (4) mentioned that it is the analysing of crime patterns. This is an alert that only a small sample of the respondents are familiar with what crime intelligence consist of, whereas crime intelligence forms an important part of various criminal investigations.

According to the samples' historical information, no one mentioned that they had undergone a crime intelligence course. One (1) of the respondents, Respondent 17, had been on an internal security course – which might be the reason why he knew what crime intelligence consists of.

The process whereby information is gathered to be analysed, is known as the intelligence gathering process. There are different stages or steps to this process, which are discussed further, below.

3.4.2 The steps in crime intelligence gathering process

Lyman (2013:119) states that the intelligence gathering process should be thought of as a process of connecting a series of interrelated components or steps. Authors differ about the number of steps in the process. The SAPS (2008) proposes a process which consists of ten (10) steps. Lowenthal (2007:54), Newburn et al (2007:204), Swanson, Chamelin and Territo (2011:245) and Weston and Wells (1997:171) all have different steps in their discussion of the intelligence gathering process. Steenberg (2008:18) has ten (10) steps in the process, consisting of the following:

- Problem/task definition
- Planning and direction
- Collection
- Evaluation
- Collation
- Analysis
- Interpretation
- Production

- Dissemination
- Action
- Feedback/closure

The six (6) steps common to all the above mentioned authors, will be discussed, and aligned with a practical explanation of how the cell phone record, as part of the intelligence gathering process, is used during CCT investigation, to identify unknown suspects.

3.4.2.1 Identify the problem

During this stage, the problem and the shortcomings of the crime (CCT) are identified, and decisions have to be taken about prioritising of the action steps.

3.4.2.2 Planning and direction

According to Steenberg (2008:19), during this stage it is important that intelligence is gathered, and to focus on the aspect of why information should be gathered. In order to gather information, a well-formulated conceptual plan should be drawn up, and it should be known what information is relevant towards addressing the problem, and where to obtain the information. The author further suggests that the following questions be asked when formulating the conceptual plan:

- What is to be done?
- When will it be accomplished?
- Where and when will it be completed?
- Who will be held accountable and who will be tasked?
- How will the task be accomplished?

3.4.2.3 Collection

The collection phase is the gathering and managing of raw data, which is then analysed to produce the final product. The gathering of data can be overtly or covertly collected. Steenberg (2008:24) is of the opinion that a collection plan will change as information is assessed and new requirements are revealed or identified. It is therefore important to keep in mind that in the collection phase, only information is produced.

3.4.2.4 Analysis

Steenberg (2008:147) explains and emphasises that if information is not analysed, it will remain as information. This is in line with Swanson et al (2011:193), who state that in the analysis stage, information will be translated into a finished intelligence product. Lyman (2013:121) and Swanson et al (2011:193) explain that during the analysis stage, information is pieced together to give meaning to the information.

The benefit of analysing data is that it confirms the reliability, validity and relevance of the information that has been analysed. The researcher, from experience, knows that the cell phone record is analysed by first going through the information that appears on the record, with the human eye, and then making decisions as to whether computer programs will be used in the analysis of the information on the record. Each computer program has its own advantages, and, depending on the intelligence that is needed, it will determine the computer program to be used. There are computer programs available which are specifically designed to analyse cell phone data. One of these programmes is Analyst's Notebook.

This is confirmation that the analysis of cell phone records can be seen as part of forensic investigation, because social science (human experience) and natural science (computer programs) can be used in the analysis of the record.

In answer to the question of how they would analyse a cell phone record, one (1) of the respondents indicated that he had undergone the Analyst's Notebook course, and that he also analyses the cell phone record with the human eye. Three (3) of the respondents said they did not analyse cell phone records, and were of the opinion that cell phone record have to be analysed by using Analyst's Notebook. Eight (8) of the respondents were of the opinion that investigators have to analyse the cell phone records by themselves, while two (2) respondents stated that they made use of experienced South African police officials in Cape Town, to analyse cell phone records. Five (5) respondents indicated that they would ask for assistance from experienced members, to analyse the cell phone records.

From the answers given by the respondents, the majority of the respondents mentioned that the analyses of cell phone records are a time-consuming process. The researcher, from experience, concurs with this viewpoint, and believes that the analysis of cell phone records is an on-going process, because the intelligence generated will sometimes identify additional cell phone numbers and information that need to be subpoenaed in terms of section 205 of the Criminal Procedure Act.

3.4.2.5 Dissemination

Lyman (2013:121) explains that the intelligence process most commonly breaks down during the dissemination stage. Amoore and De Goede (2008:49, 209) explain that dissemination ensures that the finished intelligence product is circulated among those who need to see it in report form. The researcher knows, from her experience as part of the Non-Ferrous Crime Combatting Committee (NFCCC) of the Worcester cluster, that intelligence is not distributed to the relevant units or investigation officers.

3.4.2.6 Feedback

According to Amoore and De Goede (2008:49), the inclusion of feedback in the intelligence cycle supports the continuous and iterative nature of the intelligence process. From the researcher’s experience, it is of paramount importance that during the investigation of copper cable theft, feedback is given – especially to those involved (for example, the parastatals, investigators, and crime intelligence gatherers or units). The feedback must also include the results of court judgments. According to Swanson et al (2011:193), value will be added to the intelligence process if feedback is received from those to whom the intelligence product was delivered. This would ensure an ongoing cycle of improvement.

3.5 A PRACTICAL EXAMPLE OF THE INTELLIGENCE-GATHERING PROCESS OF CCT

Table 3.1: Practical example of the intelligence gathering of CCT

• Identify the problem	• CCT is identified, and the suspect(s) is/are unknown.
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<ul style="list-style-type: none"> • Planning and direction 	<ul style="list-style-type: none"> • The suspect(s) have to be identified, in order to obtain a cell phone number(s). • A section 205 subpoena in terms of the Criminal Procedure Act has to be obtained for cell phone records or identified cell phone numbers, to obtain the cell phone record of the suspect(s). • The cell phone analyst has to analyse the cell phone records and information, with the sole purpose of identifying additional suspects, and then establishing evidence. Identify cell numbers on the cell phone records of known and convicted copper cable thieves. • Recruit new informers to obtain possible cell phone numbers of suspected copper cable thieves. • Activate and task informers to obtain information on cell phone numbers. • Recruit agents to obtain information on cell phone numbers. • Visits scrap metal dealers to obtain cell phone numbers of persons who sold copper cable. • Obtain details on reported copper cable thefts, with the main purpose of identifying suspected cell phone numbers.
<ul style="list-style-type: none"> • Collection 	<ul style="list-style-type: none"> • Collect reported copper cable theft dockets, and analyse the cell phone records and cell phone information in the case dockets, to determine whether other possible suspected cell numbers can be identified. • Speak to informers, to obtain possible cell phone numbers of suspected copper cable thieves. • Document and investigate the cell phone details and movements of known copper cable suspects and convicted copper cable thieves, if the cell phone records are available. • Apply for section 205 subpoenas, in terms of the Criminal Procedure Act, for the cell phone record(s) of suspected cell phone numbers.
<ul style="list-style-type: none"> • Analysis 	<ul style="list-style-type: none"> • Analyse cell phone records, in order to identify copper

	<p>cable suspects, or to identify possible cell phone numbers of copper cable suspects and to link them to the crime scene. Make linkages and generate intelligence from available cell phone records.</p>
<ul style="list-style-type: none"> • Dissemination 	<ul style="list-style-type: none"> • The results of the analysis of the cell phone records and information have to be distributed to either investigators of copper cable cases, or to units responsible for investigating copper cable theft, and also to police officials where the problems were identified.
<ul style="list-style-type: none"> • Feedback 	<ul style="list-style-type: none"> • Investigators and police officials to whom the intelligence was disseminated, must give feedback on the intelligence, and, if applicable, the outcome of court cases. • Feedback should include the value of the intelligence and how it was utilised. • Feedback on court cases can include the sentence of the accused, as well as the disposal of exhibits. The feedback can also include new cell phone numbers identified during the investigation and during the court hearing.

The researcher determined that during steps 1, 2 and 3 of the intelligence cycle, the decision-maker is confronted with information. During step 4 (the analysing step), the information becomes intelligence, and the intelligence has to address the crime situation.

3.6 CONCLUSION

This chapter has addressed the cell phone record, and the crime scene, as sources of information during copper cable theft investigations. Further, it was pointed out that the cell phone record can be utilised during the intelligence cycle, as explained and illustrated in the example. The analysis of information that appears on a cell phone record can be turned into intelligence, which can be valuable during the addressing of copper cable theft. It was also mentioned that there are traces left behind on copper cable theft crime scenes – for example, shoeprints, tool marks and DNA.

In this chapter, it was also stated that whenever suspects had contact with one another by using their cell phones at crime scenes, that information would be on the systems of cell phone service providers. It was also pointed out that the cell phone leaves behind information on the scene, whether the cell phone was used or not – the only requirement being that it needed to be switched on. To obtain such information that was left behind at the scene, the service provider has to be subpoenaed, in terms of section 205 of the Criminal Procedure Act. The next chapter will give a more practical discussion of cell phone records.

4. CHAPTER 4: THE PROCESSING OF INFORMATION THAT APPEARS ON A CELL PHONE RECORD INTO INTELLIGENCE

4.1 INTRODUCTION

The cell phones in our pockets are true marvels of technology, and can be used to strengthen evidence during a court case. In 2011, there were unofficial estimates that perhaps two-thirds of humanity may possess a cell phone. This means that three out of four people on the planet use a cell phone as part of their daily living, and some of these people commit crimes – which means that a significant number of cell phones may hold some evidence which relates to a crime, which is creating new opportunities for crime investigation (Doherty, 2013:2). This evidence appears as information on a cell phone record which is generated by the cell phone network's computer system (Marshall, 2008:120-121). In this chapter the cell phone record will be discussed, and a hypothetical example, based on the researcher's experience and research, will be used to explain how information on a cell phone record can be used to generate intelligence.

4.2 THE CELLULAR CONCEPT

Daniel (2012:230-231) and Frenzel (2010:183) explain that a cell phone is based on the same concept as a two-way radio which communicates wirelessly with radio-frequency spectrum with cell towers via radio signals. A turned-on cell phone registers with the cellular system by contacting the cell tower with the strongest signal. This makes it possible for the cellular system to know how to find the cell phone when a call needs to route to the phone. The researcher knows from her own experience, and after a conversation with Doctor Schmitz, that this is not a billable transaction, and will not be part of the cell phone record. However, the data exchange between the cell phone and the cellular system are kept on the system, and processed for billing purposes – and is recorded on the cell phone record. The information on the cell phone record can then be generated into intelligence which can be a helpful source during CCT investigations.

It is important, for this study, to explain the key components of the cellular network, because these are the essential components that help to generate the information which appears on the cell phone record.

4.2.1 Key components of the cellular network

According to Daniel (2012: 226) and Speed (2013:3) a cellular network consists of the following:

- Mobile stations (MS) known as cell phones.
- Base stations: these include the antennas, controller and a number of receivers and all other equipment located at each cell site. A supporting structure such as a mast or building holds the equipment.
- Base transceiver stations (BTS): these are at the base of the cell tower, and handle and process local cell phone communications and communications between the wireless network and the landline network. Each base station utilises a computerised 800 or 1900 megahertz transceiver with an antenna to provide network coverage.
- Radio network controllers (RNC): these manage base transceiver stations and are connected to BTS via landline.
- Mobile switching centre (MSC): this is where calls are processed in the network, and where a large amount of evidence ends up.
- Visitor location register (VLR): this is linked to an MSC, and contains data of subscribers which are in its location.
- Home location register (HLR): this collects information about individual subscribers, and includes subscriber identification, billing, and the services they receive, along with the current location of the cell phone roaming restrictions and the subscriber supplemental features for each phone.

4.3 THE CELL PHONE RECORD

Lochner (2007:68) states that the cell phone record is created by the HLR of the service provider of the cell phone user. This is supported by Speed (2013:4), who explains that the actions of an individual when activating a cell phone are recorded by the cellular telephone networks, on computer 'servers'. Lochner et al (2012:15)

emphasise that the cell phone record is the alpha and omega for a cell phone expert, and that it is the field laboratory of the cell phone analyst.

Lochner and Zinn (2014:172) support in essence the concept of a field laboratory and state that the cell phone record contains information of the record of the use of a handset, and information about other users that had interaction with the handset. The cell phone records, referred to as 'call data', are available to an investigating officer for a period of not less than three (3) years, in terms of the Regulation of Interception of Communications and Provision of Communication-related Information Act 70 of 2002 (RICA Act) (South Africa, 2002b). (Example 4.1 is an example of a cell phone record). The call data can be obtained through an authorised section 205 subpoena, in terms of the Criminal Procedure Act 51 of 1977.

Before the researcher discusses the hypothetical CCT example, it is important to first explain cell phone terminology which will appear on the cell phone record:

4.3.1 Explanation of terminology on a cell phone record

Table 4.1: Terminology on a cell phone record. (**Source:** Own source).

CALL DATE	The date calls were received or made
CELL ID	The base station's code reference
CELL NAME	The name of the base station activated
DURATION	The duration, in seconds, of received or made calls
IMEI	International Mobile Equipment Identity (serial number of the handset)
IMSI	International Mobile Subscriber Identity (an electronically allocated serial number of a SIM card)
MOC	Mobile Originating Call (outgoing call made)
MOSMS	Short Message Service Outgoing SMS
MSISDN	Mobile Subscriber Integrated Services Digital Network (the sim card number) 082... The cell number of the sim card
MTC	Mobile Terminated (incoming call)
MTSMS	Short Message Service Terminating Incoming
OTHER PARTY	Number of other party when making or receiving calls

4.4 THE EVIDENTIAL VALUE OF A CELL PHONE RECORD

Speed (2013:4-5) emphasises that the analysis of cell phone records is of great value during criminal investigations, that there are no universal prescribed rules and guidelines to which cell phone numbers should be analysed during investigations, and that the investigating officer has to establish which cell number should be relevant to the investigation. Daniel (2012:232) gives a reminder that a cell phone can be placed in a general geographic area through the analysis of a cell phone record. Speed (2013:5) explains that the analysis of the cell phone record will assist the investigating officer, and the court, with independent and objective evidence.

Lochner et al (2012:19) and Speed (2013:4) state that the cell phone record can provide the following evidence, after the information on the cell phone record has been analysed to produce intelligence:

- Indicates telephonic communication between specific cellular or telephone numbers.
- Corroborates or refutes the version of a complainant, witness or suspect.
- 'Proves' previous possession of stolen property – for example, a stolen cell phone or SIM card.
- Indicates the past geographical location of the cell phone user.
- Indicates the direction and approximate speed in which the cell phone moved.
- Supports the statements of witnesses.
- Highlights and points out loopholes in the investigation – a practical example being the timeline which Advocate Barry Roux used to indicate the loopholes and shortcomings regarding the time frames in the investigation in the Oscar Pistorius murder trial (Boskop CAS 110/02/2013).
- Indicates places where other possible physical evidence can be found.
- Narrows down geographical areas in which suspects can be looked for.

Daniel (2012:232) adds that other information which appears on a cell phone record, such as date, time, numbers called, usage type (SMS, MMS) and call duration, is important information needed in order to draw up a timeline during the investigation of a crime, and which is to be used as evidence during a court case.

To explain the evidential value of a cell phone record, Judge Siraj Desai, who presided in the Taliep Petersen case, stated: “The cell phone records afford compelling corroboration of the State’s case. It supports the evidence in several material respects” (Lochner et al, 2012:16). With this in mind, one can argue that the information on the cell phone record was analysed to become intelligence, which was used as evidence in court.

4.4.1 How the information that appears on a cell phone record becomes intelligence using a hypothetical example

The researcher will continue with the hypothetical example of a CCT, to show how the information on a cell phone record, after analysing that information, can become intelligence. Three (3) suspects were arrested while travelling on the N1 Highway next to the town of Rawsonville, in the direction of Cape Town. The vehicle they were using was found full of stolen Telkom copper cable. Their cell phones were seized, and the records obtained via a section 205 subpoena issued in terms of the Criminal Procedure Act. Telkom reported a theft of copper cable. After investigation, it was established that the copper cable was stolen in the vicinity of Harmonie farms, Brandwacht, Worcester. The Telkom alarm was activated on 2013/12/01 at 23:05.

A hypothetical cell phone record was created by the researcher for the purposes of this study. The information contained in the record is fictitious, but the format is an accurate version of a cell phone record, except for the alphabetical row heading, as well as the numbered column on the left-hand side of the record. This is done for referencing purposes in the discussion.

To explain certain aspects of the aim the investigator who analyses the cell phone record is advised to first examine the information on the cell phone record closely, before starting to analyse any information, as the cell phone record can contain a huge amount of information – for example, cell phone numbers of other suspects. The researcher will continue this research by visually displaying the analysing process on charts and maps, to indicate how intelligence can be generated by analysing the cell phone record.

Table 4.2: Example of cell phone records. Source: Own source.

HYPOTHETICAL CELL PHONE RECORD 1 SUSPECT ONE									
A	B	C	D	E	F	G	H	I	J
Nr.	MSIDN	IMSI	IMEI	Call date and time	Call type	Call duration	Other party	Cell ID	Cell name
1	27827805186	8978000000000699067	355419054911808	2013/12/01 21:25:58	MTC	185	27825521539	10-23502	Mbekweni, Housing Office
2	27827805186	8978000000000699067	355419054923456	2013/12/01 22:10:12	MOC	66	27739239640	10-07761	Rawsonville, Nuwehoop Co-op
3	27827805186	8978000000000699067	355419054911808	2013/12/01 22:16:10	MTC	18	27842646742	10-23543	Harmonie, Worcester
4	27827805186	8978000000000699067	355419054911808	2013/12/01 23:20:11	MTC	2	27825521539	10-33731	Harmonie, Worcester
5	27827805186	8978000000000699067	355419054911808	2013/12/01 23:25:19	MTC	2	27825521539	10-33731	Harmonie, Worcester
6	27827805186	8978000000000699067	355419054911808	2013/12/01 23:30:59	MTC	2	27825521539	10-33731	Harmonie, Worcester
7	27827805186	8978000000000699067	355419054911808	2013/12/01 23:36:14	MOSMS		28825521539	10-33731	Harmonie, Worcester
HYPOTHETICAL CELL PHONE RECORD 2 SUSPECT TWO									
A	B	C	D	E	F	G	H	I	J
Nr.	MSIDN	IMSI	IMEI	Call date and time	Call type	Call duration	Otherparty	Cell ID	Cell name
1	27727751845	655103004928862	351506051567273	2013/12/01 21:30:20	MOC	20	27847484361	10-23502	Mbekweni Housing Office
2	27727751845	655103004928862	351506051567273	2013/12/01 22:09:10	MTC	69	27745020816	10-07761	Rawsonville, Nuwehoop Co-op
3	27727751845	655103004928862	351506051567273	2013/12/01 22:15:22	MTSMS		27723547751	10-33731	Harmonie, Worcester
4	27727751845	655103004928862	351506051567273	2013/12/01 22:30:14	MTC	59	27825521539	10-33731	Harmonie, Worcester
5	27727751845	655103004928862	351506051567273	2013/12/01 23:35:20	MTC	2	27825521539	10-33731	Harmonie, Worcester
6	27727751845	655103004928862	355419054923456	2013/12/02 00:02:11	MOC	25	27847484361	10-07761	RawsonvilleNuwehoop Co-op
HYPOTHETICAL CELL PHONE RECORD 3 SUSPECT THREE									
A	B	C	D	E	F	G	H	I	J
Nr.	MSIDN	IMSI	IMEI	Call date and time	Call type	Call duration	Other party	Cell ID	Cell name
1	27825521539	655103148355750	353276056629370	2013/12/01 21:25:58	MOC	185	27827805186	10-23502	Mbekweni Housing Office
2	27825521539	655103148355750	353276056629370	2013/12/01 22:08:15	MOSMS		27392396401	10-07761	Rawsonville, Nuwehoop Co-op
3	27825521539	655103148355750	353276056629370	2013/12/01 22:30:14	MTC	59	27727751845	10-33731	Harmonie, Worcester
4	27825521539	655103148355750	353276056629370	2013/12/01 23:20:11	MOC	2	27827805186	10-33731	Harmonie, Worcester
5	27825521539	655103148355750	353276056629370	2013/12/01 23:25:19	MOC	2	27827805186	10-33731	Harmonie, Worcester

6	27825521539	655103148355750	353276056629370	2013/12/01 23:30:59	MOC	2	27827805186	10-33731	Harmonie, Worcester
7	27825521539	655103148355750	353276056629370	2013/12/01 23:35:20	MOC	2	27727751845	10-33731	Harmonie, Worcester
8	27825521539	655103148355750	355419054923456	2013/12/01 23:36:14	MTSMS		27827805186	10-33731	Harmonie, Worcester

4.4.1.1 Cell phone record one (1)

After analysing the information in the hypothetical cell phone records in Example 4.1, the following intelligence can be generated:

- Cell phone 1 received four (4) calls (see cell phone record 1, H-1, H-4, H-5 and H-6) from cell phone 3, and sends one (1) SMS (H-7) to cell phone 3.
- Cell phone 1 used two (2) handsets (see cell phone record 1, D-2, and D1).
- Cell phone 1 did not communicate with cell phone 2 (see cell phone record 1, H-1 to H-7 and cell phone record 2, H-1 to H-6).
- Cell phone 1 had communication with three (3) different cell phones of which cell phone three (3) is one (see cell phone record 1 [H-1, H-4, H-5, H-6, H-7], H-2 and H-3).
- Cell phone 1 travelled from the vicinity of the Mbekweni Housing cell phone tower in Wellington to the vicinity of the Harmonie cell phone tower in Worcester (see cell phone record 1, J-1 to J-7).
- Between 22:16:10 and 23:36:14 cell phone 1 registered on five (5) occasions the cell tower in Harmonie, Worcester (see cell phone record 1, J-3 to J-7).
- Cell phone 1 received five (5) calls (see cell phone record 1, F-1, F-3 to F-6), made one (1) call (see cell phone record 1, F-2) and sent one (1) SMS (see cell phone record 1, F-7).

4.4.1.2 Cell phone record two (2)

After analysing cell phone record two (2), the following intelligence can be generated:

- Cell phone 2 received two (2) calls from cell phone 3 (see cell phone record 2, H-4 and H-5).
- There was no communication between cell phone 2 and cell phone 1.
- Cell phone 2 used two (2) handsets (see cell record 2, D-1 to D-5, and D-6).
- Cell phone 1 and cell phone 2 used the same handset (see cell phone record 1, D2 and cell phone record 2, D-6).

- Cell phone 2 travelled from the vicinity of the Mbekweni Housing cell phone tower⁶ in Wellington to the vicinity of the Harmonie cell phone tower in Worcester (see cell phone record 2 [H-1 and H-6], H-2, H-3 [H4 and H-5]).
- Cell phone 2 communicated with four (4) other cell phones (see cell phone record 2, H-1 to H-6).
- Between 22:15:20 and 23:34:20 cell phone 2 registered on three (3) occasions the cell phone tower at Harmonie, Worcester (see cell phone record 2, J-3 to J-5).
- Cell phone 2 received three (3) calls (see cell phone record 2, F-2, F-4 and F-5), made two (2) calls (see cell phone record 2, F-1 and F-6), and received one (1) SMS (see cell phone record 2, F-3).

4.4.1.3 Cell phone record three (3)

After analysing the cell phone record, the following intelligence can be generated:

- Cell phone 3 used two (2) different handsets (see cell phone record 3, D-1 to D-7, and D-8).
- Cell phone 3 communicated with three (3) different cell phone numbers (see cell phone record 3 [H-1, H-4, H-5, H-6], H-2 and H-7).
- Cell phone 3 travelled from the vicinity of the Mbekweni Housing cell phone tower in Wellington to the vicinity of the Harmonie cell phone tower in Worcester (see cell record 3, J-1 to J-8).
- Cell phone 3 received an SMS from cell phone 1 (see cell record 3, F-8 and H-8).
- Between 22:30:14 and 23:36:14 cell phone 3 registered the cell phone tower at Harmonie, Worcester.
- Cell phone 3 made five (5) calls (4 to cell phone 1) (see cell phone record 3, F-1, F-4, F-5, and F-6), received 1 call (see cell phone record 3, F-3) and sent and received one (1) SMS from two (2) different cell phone numbers (see cell phone record 3, H-2 and H-8).

⁶ Cell phone tower is also known as the base station

4.4.1.4 Combination of intelligence generated from cell phone records one, two and three

After analysing the cell phone records of cell phones one, two and three, the following intelligence was generated:

- The suspects used four (4) different handsets. All three (3) cell phones were travelling in the same direction at more or less the same time (see cell phone records 1, 2 and 3, column J).
- Between the three (3) cell phones, they communicated with six (6) other cell phones (see cell phone record 1, H-2 and H-3), cell phone record 2, H-1, H-2 and H-3, and cell phone record 3, H-2) .
- Communication between themselves: cell phone 1 with cell phone 3 = 5 times (see cell phone record 1, H-1, H-4, H-5, H-6 and H-7), and cell phone 2 with cell phone 3 = 2 times (see cell phone record 2, H-4 and H-5).
- The three (3) suspects must have had contact with each other, as all three (3) of them made use of the cell phone with the IMEI number 355419054923456, as follows: cell phone 1 at 22:10:12 on 2013/12/01(see cell phone record 1, D-2) , cell phone 2 at 00:02:11 on 2013/12/02 (see cell phone record 2, D-6) and cell phone 3 at 23:36:14 on 2013/12/02 (see cell phone record 3, D-8).

4.4.1.5 Duration of calls

Figure 4.1 gave an indication of the calls made and received between the three (3) cell phones. The intelligence generated from this is that cell phone 3 made more calls, compared to cell phones 1 and 2. Cell phone 1 received the highest number of calls and the intelligence generated from Figure 4.3 indicates the following:

- Cell phone 1 received 209 seconds of calls.
- Cell phone 1 made 66 seconds of calls.
- Cell phone 2 received 130 seconds of calls.
- Cell phone 2 made 45 seconds of calls.
- Cell phone 3 received 59 seconds of calls.
- Cell phone 3 made 193 seconds of calls.

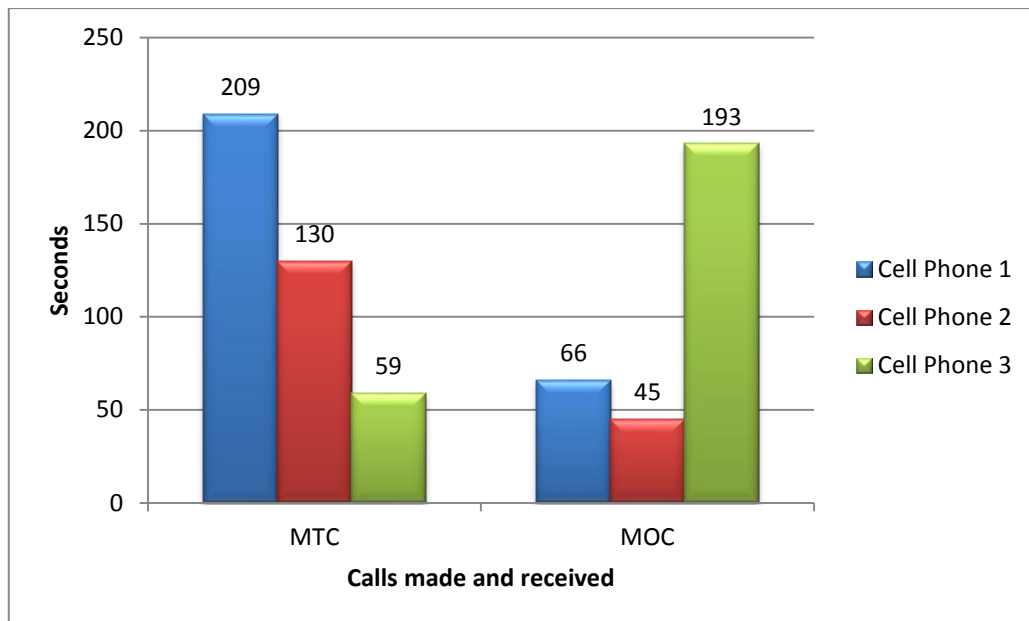


Figure 4.1: Duration of cell phone calls. (Source: Own source).

4.4.1.6 Number of communications

Figure 4.2 illustrates the number of calls and short text messages made and received by the individual cell phones involved in the hypothetical example. The following intelligence is generated by analysing the information in the hypothetical example, and is presented in the chart:

- Cell phone 1: received five (5) calls, made (1) call, sent one (1) SMS message and did not receive any SMS messages.
- Cell phone 2: received three (3) calls, made two (2) calls, sent no (0) SMS messages, and received one (1) SMS message.
- Cell phone 3: received one (1) call, made five (5) calls, sent one (1) SMS message, and received (1) one SMS message.

Additional intelligence gathered from analysing the number of communications, is that cell phone 1 received the highest number of calls, while cell phone 3 made the highest number of calls. This inference made from this intelligence can be that cell phone 3 is the dominant cell phone user (ringleader), between the three cell phones.

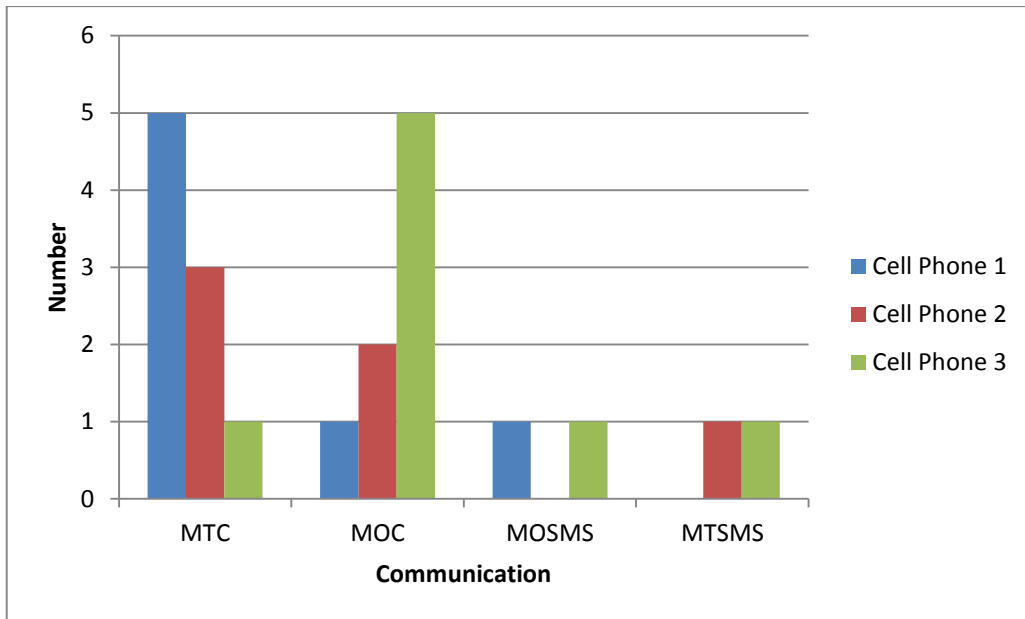


Figure 4.2: Number of communications. (Source: Own source).

4.4.1.7 Determining the geographical positioning

Table 4.3 is an extraction from the three (3) cell phone records and a geographical map of the crime scene. After analysing the extraction from the cell phone records, the intelligence generated from this was mapped in the geographical map. The intelligence indicates that all the cell phones were in the vicinity of the crime scene at more or less the same time. (In practice, the latitude and longitude of the crime scene, and the position of the cell phone tower, will be measured by a GPS (Global Positioning System) instrument, and mapped).

Table 4.3: Geographical positioning of the cell phones. (Source: Own source).

C1	22:16:10	Harmonie, Worcester
C2	22:15:22	Harmonie, Worcester
C2	22:30:14	Harmonie, Worcester
C3	22:30:14	Harmonie, Worcester
C1	23:20:11	Harmonie, Worcester
C3	23:20:11	Harmonie, Worcester
C1	23:25:19	Harmonie, Worcester
C3	23:25:19	Harmonie, Worcester
C1	23:30:59	Harmonie, Worcester
C3	23:30:59	Harmonie, Worcester
C2	23:35:20	Harmonie, Worcester

C3	23:35:20	Harmonie, Worcester	
C1	23:36:14	Harmonie, Worcester	
C3	23:36:14	Harmonie, Worcester	

4.4.1.8 Determining the travelling route of suspects

Figure 4.3 indicates three different cell phone tower locations – which in practice would be determined by measuring with a GPS instrument. Table 4.4 is an extraction from the hypothetical cell phone records (Example 4.1).



Figure 4.3: Map of travelling route of suspects. (Source: Own source).

Table 4.4: Cell phone record of the three (3) cell phones, with activation of the three (3) relevant cell phone towers. (Source: Own source).

Cell Phone 1			Cell Phone 2			Cell Phone 3		
2013/12/01 21:25	10-23502	Mbekweni, Housing Office	2013/12/01 21:30	10-23502	Mbekweni Housing Office	2013/12/01 21:25	10-23502	Mbekweni Housing Office
2013/12/01 22:10	10-07761	Rawsonville, Nuwehoop Co-op	2013/12/01 22:09	10-07761	Rawsonville Nuwehoop Co-op	2013/12/01 22:08	10-07761	Rawsonville, Nuwehoop Co-op
2013/12/01 22:16	10-23543	Harmonie, Worcester	2013/12/01 22:15	10-33731	Harmonie, Worcester	2013/12/01 22:30	10-33731	Harmonie, Worcester

After analysing Table 4.4, the intelligence gathered is illustrated in Figure 4.3.

The intelligence gathered is the following:

- Cell phones 1, 2 and 3 were travelling in the same direction at more or less the same time.

- All the cell phones were travelling on the same road.
- By determining the distance between the cell phone towers and the times that the cell towers were activated, intelligence regarding the approximate speed travelled can be determined.

4.5 ANALYST'S NOTEBOOK SKETCH OF COMMUNICATION

The researcher will explain the communication between the suspects by means of a sketch which was created using Analyst's Notebook. The sketch is a visual reflection of communication of the three (3) cell phone users (suspects) with each other, and with other cell numbers. The arrow in the line indicates the direction of the communication, and the number indicates how many times communication was made.

The intelligence gathered from this sketch clearly indicates that Suspect 3 (2782551539) is the possible ringleader of the group. He is the dominant communicator between the three of them. Intelligence gathered from this sketch also indicates that there is a possibility that suspect one and suspect two were travelling in the same vehicle because there are no communication between Suspect 1 and Suspect 2. This supports the information in Table 4.4, which indicates that they were in the vicinity of the same cell phone tower when they used their cell phones.

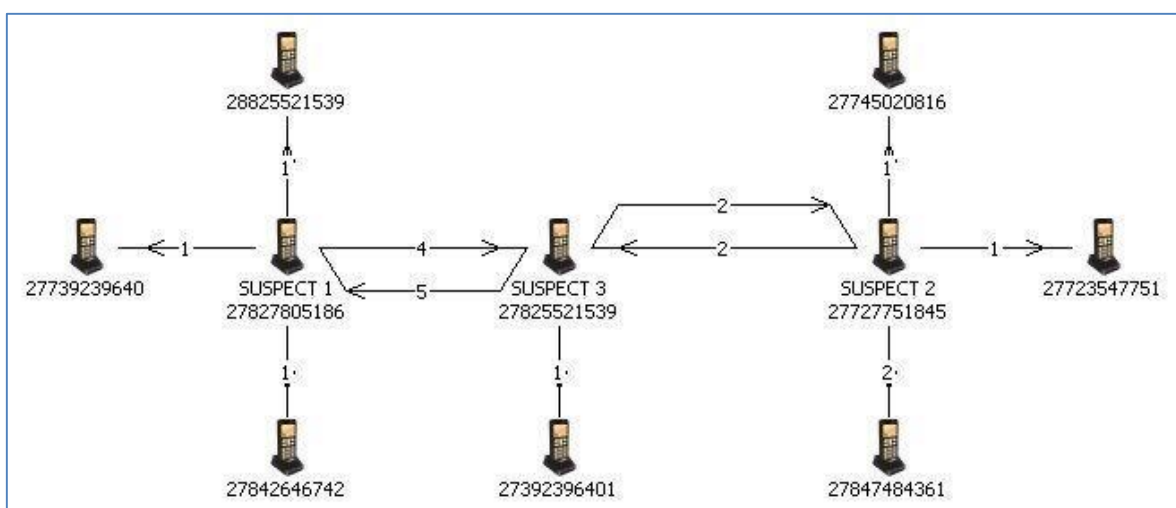


Figure 4.4: Cell phone communication between the suspects (Source: Own Source)

The researcher has shown, by means of this hypothetical CCT scenario, how the cell phone record can be a source of intelligence during CCT investigations.

4.6 CONCLUSION

The crux of this discussion was to explain how the information on a cell phone record can become intelligence. The researcher presented it visually, with tables, charts and maps. It became evident during this discussion that the analysis of a cell phone record is an important source of information during CCT investigations, as it becomes intelligence. It was also pointed out and explained that the intelligence generated from a cell phone record does have important evidential value during the investigation of CCT. The following chapter will focus on the most essential findings identified during this research, and recommendations will be made to make CCT investigations more effective.

5. CHAPTER 5: FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

Copper cable theft (CCT) has a significantly large and negative impact on the effective functioning of the infrastructure of South Africa. The aim of this research was to indicate and demonstrate that the information on a cell phone record can be used to formulate crime intelligence. The researcher addressed her aims by utilising literature (national and international) and police circulars, as well as by interviewing investigators who are involved in CCT investigation.

During her research, the researcher discovered both the practical application of the Lochner and Locard principles, and realised that with a combination of these two principles, and experience, on the side of an investigator, the information on a cell phone record could be used to generate crime intelligence, and can offer new prospects for the investigation of CCT.

A secondary aim of this research was to determine the investigative value of such formulated crime intelligence in solving CCT investigations.

To address the aims of this research, the researcher formulated the primary research question, which served as a guideline to address the topic under investigation:

“How can cell phone records be used as a source of intelligence in the investigation of copper cable theft (CCT)?”

The research question was divided further into key concepts to address the aims and research question of the research. The key concepts that were formulated to guide the research were criminal investigation, crime intelligence and cell phone records.

5.2 FINDINGS

The researcher formulated primary findings, based on the research question that was formulated to address the aims of the research. In addition to primary findings; secondary findings were also formulated. Based on the findings, recommendations

will be made. The researcher will continue with a discussion on the primary findings, followed by the secondary findings.

5.2.1 Primary findings

- The cell phone record can be used as a source of intelligence in the investigation of CCT, by analysing the information that appears on it.
- The information that appears on a cell phone record can be used to generate crime intelligence.
- Forensic investigation encompasses the use of natural and social sciences.
- For information to become intelligence, the information has to go through an analysing process.
- The analysis of a cell phone record constitutes step four of the crime intelligence cycle.
- The cell phone record is a document which is generated by a computer, and the activation of the computer system can only take place through a cell phone signal.
- The crime scene and the cell phone record are sources of information.

5.3 Secondary findings

The researcher made secondary findings on some general facts that were identified during this research.

Key concept 1: Criminal investigation

The investigator plays a very important role in the investigation of crime and must have the following skills:

- Knowledge of criminal and procedural law
- How to investigate a crime scene
- Good reasoning and interrogation skills
- An understanding of criminal behaviour
- Self-discipline and self-confidence

There are certain aims an investigator must be able to accomplish. They should be able to –

- identify the crime that was committed
- follow up leads
- link a criminal with the crime scene
- trace witnesses
- arrest the suspect(s)
- retrieve stolen goods

The investigator should also be involved in the prosecuting process, by assisting the prosecutor.

Criminal investigation is the systematic search for the truth and is used to reconstruct past events. The objectives of criminal investigation are to do the following: determine whether a crime has been committed, collect evidence, identify the perpetrator, present the best possible case to the prosecutor, and obtain witness statements. Forensic investigation, however, is a court-driven process, which includes civil and criminal investigations.

The respondents had different viewpoints of the concept 'forensic investigation', as discussed in paragraph 2.5.

The word science is derived from the Latin word *scientia*, which means 'knowledge' and it is the application of scientific knowledge to assist courts to resolve disputes, whether it be civil, criminal or administrative.

The analysis of a cell phone record forms part of the scientific investigation process, as the cell phone record has to be analysed, to assist the courts in finding out the truth, and to gain new information and intelligence.

The use of forensic science, in a multidisciplinary approach to investigating CCT, can include tool mark evidence, cell phone analysis, fingerprints, DNA, trace evidence and footmark evidence.

Key concept 2: Crime intelligence

Information is raw data, and the data that appears on a cell phone record is information.

Different types of evidence can be found at CCT crime scenes. This evidence includes the following:

- DNA of the suspect – for example, blood on pillars⁷ and wires.
- Cigarette butts and drinking vessels (for example, empty tins).
- Fingerprints on touched items.
- Shoeprints and foot imprints inside shoes left at a crime scene.
- Tyre marks.
- Tool mark comparisons.
- Fibres from the suspect's clothes.
- Paint from the vehicle used.
- Soil clinging to shoes of suspects, vehicle or copper cable, found in the possession of the suspect that can be compared with the soil at the crime scene.
- Loose buttons from the suspect's clothes, dropped at the crime scene.
- The information that appears on a cell phone record – because the information that is stored on the database of the service provider was generated at the crime scene.

The research group had a limited knowledge of what type of evidence is available on the CCT crime scene.

Crime intelligence is an end product of a process whereby information is collected and processed in a systematic manner to generate intelligence.

The research group was not that familiar with the concept 'crime intelligence' compared to the given literature. Although seventeen (17) respondents included the word 'information' in their explanation of crime intelligence, only four (4) mentioned that it is the analysis of information.

⁷ Injuries while stealing copper cable can occur, which can leave DNA at the scene (for example, blood)

The crime intelligence cycle is a process which can be utilised during CCT investigation, and consists of the following six common steps: identification of the problem, planning and direction, collection, analysis, dissemination, and feedback.

Key concept 3: The cell phone record

The cell phone record contains information which, if analysed by using scientific principles, becomes intelligence.

A cell phone record is the total version of the call data which was logged through the network.

The following information appears on the cell phone record: date and time of calls, type of calls (incoming or outgoing), date and time of SMS messages, names of base stations, cell numbers, SIM card numbers, base station names, number of base station(s), and GPRS streaming.

The respondents were not that familiar with the type of information which occurs on a cell phone record.

There is a lack of knowledge and training in the field of cell phone record analysis, among the respondents. Only one (1) of the respondents had undergone a relevant course Analyst's Notebook.

The analysis of a cell phone record does have evidential value, and it can provide the investigator with the following intelligence:

- Corroborate or refute the version of a suspect, witness or victim.
- Highlight or point out loopholes in the investigation.
- Give an indication where physical evidence can be found.
- Narrow down geographical areas where suspects can be found.
- Geographical positioning of suspects.
- Routes travelled by suspects.
- Speed travelled by cell phone user (activation of cell phone towers).
- Cell number(s) of other suspect(s).
- Communication between suspects.

- Duration of calls between suspects.
- Number of communications between suspects (calls and SMS messages).
- The dominant person between suspects.
- Draw up a timeline of a crime.

5.4 RECOMMENDATIONS

Based on the findings of this study, the following recommendations can be made: Different training operational and theoretical guidelines have to be formulated within the SAPS, to provide guidelines for investigators, which stipulate how CCT crime scenes must be investigated, and how the cell phone record can be used as a source of intelligence during CCT investigations.

5.4.1 Criminal investigation

A module within the detective training course has to be developed and implemented, to assist and guide investigators, including the following aspects:

- Familiarisation with the concepts of criminal investigation, forensic investigation, forensic science, social science, and the use of a multidisciplinary approach in the investigation of CCT.
- Recognition of the value of both the cell phone record and the CCT crime scene as sources of information during CCT investigations.

5.4.2 Crime intelligence

It is recommended that standards be developed, and the way to implement the crime intelligence cycle during CCT investigations, be indicated.

The following topics need to be incorporated in training manuals, whether in service training or as part of courses:

- The value of the cell phone record and CCT crime scene as sources of information during CCT investigations.
- Explanation of 'crime intelligence'.
- Explanation of the crime intelligence cycle, and how to implement the cycle in any investigation.

- The importance of the analysis stage of the crime intelligence cycle, as it is where the cell phone record is interpreted, and where information becomes intelligence.
- The importance of the crime scene and the cell phone record, as part of operational intelligence.

5.4.3 Cell phone record

It is recommended that theoretical and practical training be given to detectives during both the NFMCCC meetings and the cluster forum meetings, including the following:

- The terminology that appears on the cell phone record.
- The evidential value of the cell phone record.
- A step-by-step guideline on how information is taken from the cell phone record and generated into intelligence.
- How to present the cell phone record in court, by referring to previous case law where the cell phone record was presented during court procedures.
- The analysis of the different cell phone records of service providers.

It is strongly recommended that a module covering cell phone records be incorporated into detective courses, include the abovementioned aspects, as well as the following:

- The Lochner and Locard principles.
- The Analyst's Notebook training course, in which detectives will learn how to electronically analyse cell phone records.

The researcher recommends further that cell phone analysts be identified and trained, who can especially assist in cases where CCT syndicates are involved. A cell phone analyst unit needs to be stationed at each cluster of the Crime Intelligence units. It is strongly recommended that the guidelines as mentioned on cell phone records be available on the INTRANET of the SAPS system, for the use and guidance of all members of the SAPS.

5.5 Conclusion

It was seen, during this research, that the cell phone record contains information which becomes intelligence after it has been analysed through the intelligence gathering process. Such information on the cell phone record has to be analysed during the analysis phase of the crime intelligence cycle, before it can be regarded as intelligence.

The research findings of this study were based on empirical data and reliable literature which has answered the research question and aims of this research. The results of this research have shown that a need for training exists among detectives in the Worcester cluster, to help them analyse cell phone records. Recommendations have been made, based on the findings during this research, in order to improve the investigation of CCT.

Cell phones are a global way of life, and it is therefore necessary for the acknowledgment of the need for cell phone training in the SAPS, in order to improve CCT investigation. The researcher hopes that this research will empower investigators with heightened knowledge of the value of cell phone records during CCT investigations, to the increase of criminal convictions, the lessening of financial loss to South Africa, and thus to the benefit of society as a whole.

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8. CAS NUMBERS

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CAS 92/03/2005 Cloetesville

CAS 603/09/2005 Norwood

CAS 448/10/2010 Montagu

CAS 105/09/2011 Rawsonville

CAS110/02/2013 Boskop

9. INTERVIEWS

Respondent 9, 2013. Investigator. Worcester. 6 September.

Respondent 10, 2014. Investigator. Worcester. 15 February.

Respondent 17, 2014. Investigator. McGregor. 15 February.

ANNEXURE A
– interview schedule –

10. ANNEXURES

10.1 ANNEXURE A: INTERVIEW SCHEDULE

TOPIC: THE ANALYSIS OF A CELL PHONE RECORD AS A SOURCE OF INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE THEFT

RESEARCH AIMS

The researcher aims to establish how the cell phone record can be used as a source of intelligence during copper cable theft investigations. The results will provide guidelines on how the cell phone statement can be utilised as a source of intelligence during copper cable theft investigations.

Section 1: What are the different forensic investigation methods used to investigate copper cable theft?

Section 2: How is intelligence gathered during the investigation of copper cable theft?

Section 3: How can cell phone records be used as a source of intelligence in the investigation of copper cable theft?

You are kindly requested to answer the following questions in this interview schedule, for the researcher. The questions, responses and results will be revealed.

The researcher is bound to her assurances and guarantees by the Ethics Code for Research of the University of South Africa. The information you provide will be used in a research project for a Master of Technology degree registered with the Programme Group: Police Practice at the University of South Africa. The analysed and processed data will be published in a research report.

Your answers will be noted by the interviewer herself, on paper. Should any question be unclear, please ask the researcher for clarification. Only one answer per question is required. When answering the questions, it is very important to give your own opinion.

Written permission has been obtained in advance from the South African Police Service, for the interview to be conducted.

I hereby give permission to be interviewed and that information supplied by me can be used in this research.

YES (Please indicate with a ✓)

TOPIC: THE ANALYSIS OF A CELL PHONE RECORD AS A SOURCE OF INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE THEFT

HISTORICAL INFORMATION

1. How old are you?
2. What is your rank?
3. Specify your tertiary qualifications.
4. How many courses have you attended during your career as a detective?
Name the courses.
5. How many years of investigation experience do you have?
6. How many years of service do you have in the South African Police Service?
7. Did you receive training in any aspects relating to cell phone record analysis or cell phone technology? If 'yes', specify the training.
8. Have you testified in court with regard to cell phone records? If 'yes', how many times?
9. Did you receive training in the investigation of copper cable theft? If 'yes', specify the training.

SECTION 1: WHAT ARE THE DIFFERENT FORENSIC INVESTIGATION METHODS USED TO INVESTIGATE COPPER CABLE THEFT?

10. What does crime investigation entail?
11. What does forensic investigation entail?
12. What do you understand by the concept 'forensic science'?
13. What are the objectives of criminal investigation?
14. What role does forensic science play in the investigation of crime?
15. How is forensic science utilised in the investigation of crime?
16. How does physical evidence relate to forensic investigation?
17. What investigation methods do you utilise during the investigation of copper cable theft?
18. What scientific method of investigation do you utilise during copper cable theft investigations?

SECTION 2: HOW IS INTELLIGENCE GATHERED DURING THE INVESTIGATION OF COPPER CABLE THEFT?

19. What is information?

- 20. What does crime intelligence entail?
- 21. What is the intelligence gathering process?
- 22. How do you, as an investigator, gather intelligence during copper cable theft investigations?
- 23. How can cell phone records be used in the intelligence gathering process?
- 24. What are the different categories of crime intelligence sources?

SECTION 3: HOW CAN CELL PHONE RECORDS BE USED AS A SOURCE OF INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE THEFT?

- 25. What is a cell phone statement?
- 26. What is a cell phone record?
- 27. What information appears on the cell phone record?

28. How can the information that appears on the cell phone record be of use during the investigation of copper cable theft?
29. What procedure do you follow to obtain the cell phone record?
30. How do you analyse a cell phone record?

ANNEXURE B
– structuring of NFMCCC –

10.2 ANNEXURE B: STRUCTURING OF NFMCCC

G.P.-S 002-0222

SAPS 21

SUID-AFRIKAANSE POLISIEDIENS



SOUTH AFRICAN POLICE SERVICE

Privaatsak / Private Bag **X540**

Verwysing Reference	2/28/23
Navrae Enquiries	Col MM Mangwani / Col G Pretorius
Telefoon Telephone	012 353 6313
Faksnommer Fax number	012 353 6574
E-Pos E-Mail	pretoriusg@saps.org.za

**DIE AFDELINGSKOMMISSARIS
THE DIVISIONAL COMMISSIONER**

**VISIBLE POLICING
SIGBARE POLISIERING**

**PRETORIA
0001**

2011-02-23

All Provincial Commissioners
SOUTH AFRICAN POLICE SERVICE

STRUCTURING: PROVINCIAL NON-FERROUS METALS CRIME COMBATTING COMMITTEE (NFMCCC)

1. INTRODUCTION

- 1.1 The theft of non-ferrous metals in South Africa has become a serious problem that had a detrimental effect on a variety of role players throughout the country in recent years.
- 1.2 The problem with regard to the theft of specifically copper and aluminium has existed for many years and since 1993, it has escalated to such an extent that losses now run into millions of rands annually. Although the incidents and the related costs decreased between 2001 and 2004, the occurrence of this crime increased sharply in 2005 to 2009. This can be attributed to the dramatic increase in the copper and aluminium prices as a result of the growth in international demand for the materials, among other factors.
- 1.3 The victims do not only suffer direct financial losses as a result of having to replace the stolen material, but also other consequential, associated or hidden costs, such as -
 - impact on the image of the organization;
 - impact on service delivery;
 - impact on employee morale;
 - loss of revenue or income;
 - labour costs to replace and repair;
 - overtime costs for staff;
 - cost of equipment and vehicles;
 - security costs to protect and safeguard assets and customers; and
 - cost of electronic equipment, alarms and monitoring.

- Increasing demand for copper and aluminium locally and internationally;
 - Insufficient control/legislation regarding processing, sale, import or export of non-ferrous metals;
 - Low risk involved in accessing some of the networks (low voltage); and
 - Availability of the market for the sale of stolen material.
- 2.8 Effective policing of the scrap metal market has been a challenge because of insufficient and outdated legislation, however the Second-Hand Goods Act 2009 (Act No 6 of 2009), specifically designed to regulate the trading of scrap metal, has been promulgated and still has to be operationalized.
- 2.9 From 1993 to 2008, the NFTCC was chaired by the private sector. In 2008, a decision by the then Deputy Minister for Safety and Security was made that the South African Police Service should take over the chairmanship of the NFTCC because of its direct link with the prevention of crime and that a high-ranking police delegate should chair the NFTCC. Emanating from this decision, the chairmanship was handed to Asst Comm Lebeya from the National Organised Crime component.
- 2.10 The name of the NFTCC was changed to Non-Ferrous Metals Crime Combating Committee (NFMCCC) in late 2008 and chairmanship was transferred from Asst Comm Lebeya to the Head: Firearms, Liquor and Second-Hand Goods Control, Asst Comm Nkomo.
3. **NFMCCC STRATEGY**
- 3.1 A mandate (set out below) was developed for the NFMCCC to actively address the theft of non-ferrous metals:
- Establishing and maintaining a NFMCCC to address the theft and related crimes pertaining to non-ferrous metals;
 - Implementing a joint venture between the relevant stakeholders to effectively address crime pertaining to non-ferrous metals on national and provincial level;
 - Coordinating integrated crime combating operations that focus on the suppliers/dealers and end-users;
 - Monitoring the import and export of non-ferrous metals;
 - Launching and implementing a non-ferrous metal anti-crime communication plan and strategy, including educational awareness campaigns;
 - Monitoring investigations pertaining to non-ferrous metal-related crimes;
 - Establishing governance to effectively deal with non-ferrous metals in SAPS 13 stores; and
 - Establishing mechanisms (training) for the effective identification of non-ferrous metals by law enforcement officers.
- 3.2 The NFMCCC identified three distinct areas to address the theft of non-ferrous metals, namely -
- 3.1.1 perpetrators: thieves, organised groups and gangs that perpetrate theft
- 3.1.2 product - mostly copper and aluminium in different forms:
- Overhead lines, underground cables, copper earthing (telecoms, transport and electricity);

- Electrical Substations;
- Signal cables;
- Non-ferrous metal in railway carriages (doors, window frames, basins, bearings); and
- Other (aluminium irrigation equipment etc).

3.1.3 Scrap Metal Market

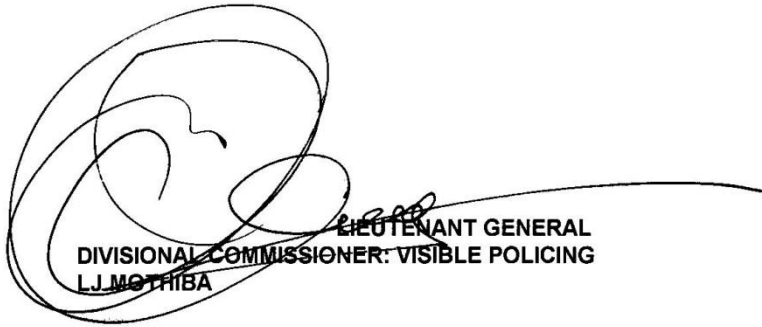
Although this figure varies monthly, there are currently approximately 2 969 registered scrap metal dealers in the country. As theft constitutes a criminal offence, most strategies (proactive and reactive) are aimed at supporting the Criminal Justice System to facilitate the prosecution process. This includes -

- to be able to effectively and efficiently police the scrap market;
- that the material of most of the companies has been marked and can be identified as property of any of the organisations concerned;
- that most networks are fitted with specially-developed alarms;
- that the SAPS, supported by the members of the NFMCCC, conduct regular proactive operations involving specific identified scrap merchants; and
- the launching of several awareness campaigns, as well as obtaining assistance from the general public to address the theft problem.

4. STRUCTURING: NFMCCC

- 4.1 Based on the above strategy, it has been decided that in order to vigorously address non-ferrous metal-related crime in South Africa, it is of the utmost importance that the South African Police Service move from a reactive to a proactive policing methodology.
- 4.2 In order to achieve the above, the NFMCCC function was transferred from the Division: Detective Services, to the Division: Visible Policing.
- 4.3 All provinces are requested to re-structure their NFMCCC under the chairmanship of the Provincial Head: Visible Policing (Brigadier level or higher).
- 4.4 NFMCCC meetings should be scheduled with all relevant role players on a monthly basis.
- 4.5 The Detectives will still form an integral part of the NFMCCC within the various levels of the South African Police Service, in order to ensure continuity to effectively address investigations.
- 4.6 Information on organised crime generated from the NFMCCC must be channelled to the Organised Crime Secretariat.

5. Your co-operation in ensuring that non-ferrous metal theft in South Africa is receiving the necessary attention it deserves, is appreciated



LIEUTENANT GENERAL
DIVISIONAL COMMISSIONER: VISIBLE POLICING
LJ.MOTHIBA

ANNEXURE C
– RESEARCH APPLICATION AND PERMISSION –

Worcester SAPS

From: WC:OD Research
Sent: 13 February 2013 11:25
To: Ashton SAPS; Bonnievale SAPS; Robertson SAPS; Montagu SAPS; De Doorns SAPS; Touwsrivier SAPS; Swellendam SAPS; Worcester SAPS; McGregor SAPS; Barrydale SAPS
Cc: Heilbron Donovan - Brigadier; WC:OD Strategic Management-Commander
Subject: FW: APPLICATION TO CONDUCT RESEARCH WITHIN SAPS: THE CELLPHONE STATEMENT AS SOURCE OF INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE THEFT: MASTERS DEGREE STUDY: UNISA: RESEARCHER: W/O VAN NIEKERK
Attachments: Warrant Officer Van Niekerk scanned approved documents.pdf; LETTER FOR VAN NIEKERK.pdf



Enquiries	SAC Hoko
Telephone	021- 417 7529
Email	wc:od research

Honourable Station Commanders

- W/O Van Niekerk has submitted an application to conduct research within the SAPS, focusing on the cell phone statement as source of Intelligence in the investigation of copper cable theft, which was approved by the Provincial Commissioner
- Approved letter is attached for your information.
- Please acknowledge receipt of this correspondence and return to this office.
- Kindly facilitate the arrangements of interviews with your respective station members for the research purposes.
- W/O Van Niekerk's contact details are as follows:

W/O Van Niekerk
Cell Nr: 082 7805 186
Internal: Worcester SAPS
Email: juan12@vodamail.co.za

Respectfully

Colonel ZGDouse
 F/Provincial Head: Organisational Development and Strategic Management
 Western Cape
 Private Bag X 9004, Cape Town, 8000
 1st Floor, CPA Building Alfred Street, Green Point
 Tel: (021) 4177105
 Fax: (021) 4177416
 Mobile: 0825223173
 Internal e-mail: WC:Strategic Management-Commander
 External e-mail: dousezg@saps.gov.za

2013/02/13

South African Police Service



Suid-Afrikaanse Polisie

Private Bag
Privaatsak

X9004, CAPE TOWN / KAAPSTAD, 8000

Fax: (021) 417-7416
Faks:

Your reference/U verwysing:

THE PROVINCIAL COMMISSIONER
DIE PROVINSIALE KOMMISSARIS

My reference/My verwysing: 25/7/2/1(201200405)

Enquiries/Navrae:

Brig Heilbron
Col Douse

WESTERN CAPE
WESKAAP

Telephone/Telephone:

021- 417 7209
021- 417 7190

2013-02-08

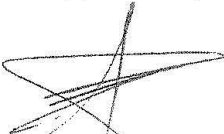
STATION COMMANDERS
SOUTH AFRICAN POLICE SERVICE
WESTERN CAPE

Ashton SAPS, Berrydale SAPS, Bonnievale SAPS, Mac- Gregor SAPS, Robertson SAPS,
Montague SAPS, De Doorns SAPS, Touwsriver SAPS, Swelendam SAPS and Worcester
SAPS,

**RESEARCH APPLICATION: THE CELL PHONE STATEMENT AS SOURCE OF
INTELLIGENCE IN INVESTIGATION OF COPPER CABLE THEFT: MASTERS DEGREE
STUDY: UNISA: RESEARCHER/O VAN NIEKERK**

1. W/Officer Van Niekerk has submitted an application to conduct research within the SAPS, focusing on the cell phone statement as source of intelligence in investigation.
2. As per information note approved by the Provincial Commissioner, W/Officer Van Niekerk will conduct her research at your respective stations and we request your assistance in this regard.
3. Your contact details have been forwarded to the researcher and she will be in contact with your office in due course.
4. Please acknowledge receipt of this letter and forward it back to our office.

Thanking you in anticipation.


.....COLONEL
F/PROVINCIAL HEAD ORGANIZATIONAL DEVELOPMENT & STRATEGIC MANAGEMENT
ZG DOUSE



UNDERTAKING

DISCLOSURE OF INFORMATION

RESEARCH PROPOSAL: THE CELL PHONE STATEMENT AS
SOURCE OF INTELLIGENCE IN THE INVESTIGATION OF COPPER
CABLE THEFT: MASTERS DEGREE STUDY: UNISA:
RESEARCHER: W/O VAN NIEKERK

I ANNA-MARIE VAN NIEKERK, REGISTERED STUDENT AT UNISA
, HEREBY CONFIRM THAT

I AM FULLY AWARE OF THE CONTENTS OF SECTION 70 OF THE
SOUTH AFRICAN POLICE ACT, ACT 68 OF 1995.

THE INFORMATION TO BE OBTAINED WILL ONLY USED FOR
ACADEMIC PURPOSES.

Ann 0471551-9
RESEARCHER: W/O VAN NIEKERK
MASTERS DEGREE STUDY: UNISA

SIGNED ON 2013/1/25 AT (PLACE) Worcester

DATE 2013/1/25

Witness (Supervisor/Promoter
Name Willis Mervin

COLONEL
W.M. SMITH



CONDITIONS

RESEARCH PROPOSAL: THE CELL PHONE STATEMENT AS SOURCE OF INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE THEFT: MASTERS DEGREE STUDY: UNISA: RESEARCHER: W/O VAN NIEKERK

I, ANNA-MARIE VAN NIEKERK, MASTERS DEGREE STUDY: UNISA,
HEREBY CONFIRM THAT

I WILL CONDUCT THE RESEARCH BY INTERVIEWING THE MENTIONED OFFICERS IN THE SOUTH
AFRICAN POLICE SERVICE IN THE WESTERN CAPE, SUBJECT TO THE FOLLOWING CONDITIONS,
THAT:

1. I will respect the privacy of the members and will not divulge any information received from the members of the Service and that such information will at all times be treated as strictly confidential;
2. I will sign an undertaking in regard to the unauthorised disclosure of information;
3. I will sign an indemnity, indemnifying the Service against any injury, loss of life or property or damage to property while on the premises of the Police Station;
4. I will conduct the research without any costs to the Service;
5. I will make the necessary arrangements with the senior officers who are to be interviewed;
6. I will not let the conducting of the research or interviews with the senior officers cause any disruption to the duties of the officers of the Service or hamper service delivery;
7. I will use my own transport for the purpose of the research;
8. I will sign the necessary indemnity if there is a need to travel with state transport to a certain point;
9. I will provide my own stationary for the purpose of conducting the interview;
10. I will only make tape recordings of the interviews with the permission of the officers;
11. I will only conduct an interview with the officers and will not collect any documents or information in another format other than that which comes from the interview;
12. I will conduct the research alone but will supply the full identification and purpose of any person who might be accompanying me on the day of the visit to the station;
13. I will at the completion of the research, donate a copy of the research to the Service.

SIGNED ON 2013/11/24 AT (PLACE) Worcester

Anna Marie van Niekerk
RESEARCHER: W/O VAN NIEKERK
MASTERS DEGREE STUDY: UNISA



INDEMNITY

RESEARCH PROPOSAL: THE CELL PHONE STATEMENT AS SOURCE
OF INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE
THEFT: MASTERS DEGREE STUDY: UNISA: RESEARCHER: W/O VAN
NIEKERK

I, ANNA-MARIE VAN NIEKERK, MASTERS DEGREE STUDY: UNISA,
HEREBY CONFIRM THAT

FOR THE PURPOSE OF CONDUCTING INTERVIEWS WITH THE
OFFICIALS, I WILL BE ACCESSING THE RELEVANT POLICE PREMISES
AT OWN RISK,

AND,

I HEREBY INDEMNIFY THE SERVICE OR ANY MEMBER AGAINST ANY
CLAIM FOR ANY BODILY INJURY, LOSS OF LIFE AND THE LOSS OR
DAMAGE OF PROPERTY WHICH MAY OCCUR AS A RESULT OF ME
BEING ON THE PREMISES FOR THE PURPOSE OF CONDUCTING THE
RESEARCH.

SIGNED ON 2013/11/25 AT (PLACE) Worcester
DATE 2013/11/25

Anna Marie van Niekerk 0471551-9
RESEARCHER: W/O VAN NIEKERK
MASTERS DEGREE STUDY: UNISA

Witness(Supervisor/Promoter)

(1)

Name

Willis Mervin Smith
COLONEL
W.M. SMITH



AMAPOLISA OMZANTSI AFRICA

INFORMATION NOTE

REF : 25/7/2/1(201200405)

DATE: : 2012-12-06

TO : The Provincial Commissioner
SA Police Service
WESTERN CAPE

FROM : The Provincial Head
Organisational Development & Strategic Management
SA Police Service
WESTERN CAPE

Compiled by: SAC Hoko

RESEARCH PROPOSAL: THE CELL PHONE STATEMENT AS SOURCE OF INTELLIGENCE IN THE INVESTIGATION OF COPPER CABLE THEFT: MASTERS DEGREE STUDY:UNISA: RESEARCHER: W/O VAN NIEKERK

1. A request was received from W/O A Van Niekerk, a registered student at UNISA, the applicant aims to establish how cell phone records can be used as a source of intelligence during copper cable theft investigations. The applicant's proposal has been perused, evaluated and recommended by Head of Strategic Management, Head Office.
2. The aim of the research is
 - to establish how cell phone records can be used as a source of intelligence during copper cable theft investigations.
3. Warrant Officer Van Niekerk will conduct interviews with nineteen (19) detectives that are involved in the investigation of copper cable theft within the Worcester Cluster in the Western Cape Province.

The following information will be utilized in the research dissertation:

- Cas numbers of copper cable thefts within the Worcester cluster (2011-2012).
- Statistics of copper cable thefts within the Worcester cluster (2011-2012).
- Circulars related to copper cables thefts (2011-2012).
- Cas numbers where forensic science was applied to solve crimes (2011-2012).

4. RECOMMENDATION

This office has perused the application, an undertaking should be obtained from the research promoter and the relevant members that;

- the applicant will not divulge specific information from the interviewees and their information and identity will remain confidential;
- all information will at all times be treated strictly confidential;
- the conducting of interviews are confined to the officials at the identified units/stations;
- the applicant will complete an indemnity form prior to the commencement of her research, in terms of which the SA Police Service is indemnified against any injury, personal damage or

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- any loss suffered during the research;
- the applicant will complete an undertaking form prior to commencement of her research, pertaining to disclosure of information in terms of which he is agreeable to the contents of section 70 of the SAPS Act, Act 68 of 1995;
- the applicant may not publish a statement/affidavit received, nor may the researcher publish the content of the statement;
- the applicant may not disclose information about any case or personal details of any person mentioned in such statement/affidavit in any publication or to the media (printed or otherwise)
- the applicant will conduct research without any disruption of duties of the officers of the Service;
- prior arrangements must be made timeously with the respective officers who are to be interviewed to ensure that service delivery is not hampered;
- that the applicant may not take photographs of any office or state building as it may compromise security of the police station, and is prohibited by law;
- the applicant will only make tape recordings of the interviews with the permission of the officers being interviewed;
- the applicant will provide her own transport for the purpose of her research;
- the applicant will provide her own resources for the purpose of conducting her research;
- the applicant will only conduct an interview with the officers and will not collect any documents or information in another format other than that which comes from the interviews;
- the applicant will conduct the research alone but will supply the full identification and purpose of any person who might be accompanying the researcher on the day of the visit to the station/unit;
- after completion of the research, the applicant will donate a copy of the research to the Service;

..... CAPT
// PROVINCIAL COMMANDER: STRATEGIC MANAGEMENT: WESTERN CAPE
N SOGIBA

Date 2012-12-07

COMMENTS

Recommends.
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..... BRIGADIER
PROVINCIAL HEAD: ORGANIZATIONAL DEVELOPMENT & STRATEGIC MANAGEMENT
HD HEILBRON

Date 2012.12.07

RESEARCH PROPOSAL: THE CELL PHONE STATEMENT AS SOURCE OF INTELLIGENCE IN THE
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VAN NIEKERK

COMMENTS


*affirmative is supported subject
to set conditions.*


MAJOR GENERAL
PROVINCIAL HEAD: LEGAL SERVICES
EN DLADLA

Date *2012-12-07*

COMMENT

Recommended


MAJOR GENERAL
DEPUTY PROVINCIAL COMMISSIONER: OPERATIONS OFFICER: WESTERN CAPE
SJ JEPHTA

Date *2012-12-14*

APPROVED *NOT APPROVED*

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LIEUTENANT GENERAL
PROVINCIAL COMMISSIONER: WESTERN CAPE
AH LAMOER

Date *2012-12-19*

ANNEXURE D
– CORRESPONDENCE WITH DR PMU SCHMITZ –

10.4 ANNEXURE D: LETTER DR P SCHMITZ

Anna van Niekerk

From: Peter Schmitz [PSchmitz@csir.co.za]
Sent: Monday, November 10, 2014 11:55 AM
To: juan12@vodamail.co.za
Subject: Fwd: RE: Cell phone record

Hallo Anna,

Soos versoek.

Groete

Peter

>>> "Anna van Niekerk" <juan12@vodamail.co.za> 02/04/2014 07:24 >>>

Hallo Doktor Schmitz dit help BAIE. Baie dankie!!!

Ek sou graag in die toekoms u wil besoek en sommer net gesels oor die selfoon netwerke ens ens

Ek is nog in 'n groot 'leer skool' met die selfoon bedrywighede!!

Groete uit 'n baie nat en koue Boland!!

Anna-Marie

From: Peter Schmitz [mailto:PSchmitz@csir.co.za]
Sent: Tuesday, April 01, 2014 3:28 PM
To: Anna van Niekerk
Cc: Lochnht@unisa.ac.za
Subject: Re: Cell phone record

Hallo Anna-Marie en Hennie,

Bly om weer van jou te hoor.

My interpretasie/definisie:

"A cellular telephone record is a cellular telephone activity that has been recorded by a service provider for billing purposes. The secondary usage is the use of this record for forensic purposes."

Hoop dit help.

Groete

Peter

Dr Peter Schmitz MRSSAf

Principal Researcher: GIS and data logistics
Sustainable Human Settlements and Informatics

CSIR Built Environment

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Mobile: +27 82 784 20 07

GPS: Lat -25.748919 Long 28.277532

PO Box 395, Pretoria 0001

Gauteng, South Africa

>>> "Anna van Niekerk" <juan12@vodamail.co.za> 01/04/2014 10:42 >>>

Goeie dag Doktor Schmitz

Ek het al in die verlede met u kontak gehad. Hennie Lochner is my dosent by UNISA. My navorsing gaan oor die selfoon record in die ondersoek van koper kabel diefstalle.

Hennie het die voorstel gemaak dat ek u mening bekom tov wat u as 'n selfoon rekord beskou of in kort hoe definieer u 'n selfoon rekord.

Kan u my asb behulpsaam wees asb?

Ek is van Worcester in die Boland en 'n Adjudant-Offisier in die SAPD.

Groete

Anna-Marie van Niekerk

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