

**Use of the Biological Body-Fluid Detection Dog for
Investigation of Rape Cases**

by

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for the degree of

MASTER OF ARTS

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UNIVERSITY OF SOUTH AFRICA

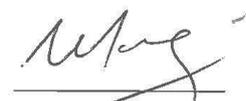
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FEBRUARY 2018

CERTIFICATE OF AUTHENTICITY

CERTIFICATE OF AUTHENTICITY

I declare that this research dissertation "**Use of the biological body-fluid detection dog for investigation of rape cases,**" is my own, unaided work, and that all sources used or quoted have been reflected and acknowledged by means of complete referencing. The dissertation is being submitted in partial fulfilment of the requirements for the degree of Magister Technologiae in the subject of Forensic Investigation at the school of Criminal Justice, University of South Africa.



Vishyal Maharaj

14 February 2018
Date

LANGUAGE EDITORS'S DECLARATION

To whom it may concern

2018-02-11

I, Naómi AC Schulze, an independent language practitioner operating in Centurion, hereby declare that I was requested to carry out the language editing in respect of a dissertation written by Mr V Maharaj, student no. 751 5774

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DEDICATION

I dedicate this research to all our South African Police Service (SAPS) K9 handlers and K9s who have sacrificed their lives for our safety; may your souls rest in peace. The exemplary work done by the members of the K9 Units and their dedicated K9s, and my interaction and involvement with them, have given me the motivation to pursue these studies.

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ABSTRACT

Serious and violent crime in South Africa (SA) has been on the rise in the last few years. The SAPS has been stretched to the maximum in its efforts of trying to stabilise the situation, and has applied various tactics and strategies to eradicate crime. This included, among other things, changes to the basic training programme and reintroduction of specialised units. The success or failure of any criminal investigation will still often depend on the detection and analysis of physical evidence found on the crime scene. Crimes such as rape will always leave behind physical evidence in the form of body-fluids. The detectives need not be experts in order to detect or analyse this physical evidence, but should be experienced enough to know which experts or investigative aids must be used to ensure maximum recovery of the evidence.

The purpose of this study was to determine how the Biological Body-fluid Dog (BBFD) can assist detectives in the investigation of rape cases. The researcher has chosen a unique investigative aid in the form of man's best friend, namely "The Police K9" (canine). The literature shows that trained police dogs have achieved outstanding success in numerous fields around the world, i.e. from narcotic busts, detection of explosives, to countering terrorist threats, to the most chilling search-and-rescue operations. The SAPS has sent its search-and-rescue dogs to many countries abroad to assist in natural disasters. Dogs have been trained by various police agencies for various purposes, but the BBFD dog is unique to the SAPS, and is trained to detect only human blood and semen. The use of K9s in the complex forensic science environment can never be doubted or overlooked.

The main problem facing the Booyens SAPS was the low arrest and conviction rate in rape cases, due to a lack of evidence. The researcher hopes to broaden the detectives' knowledge and skills regarding the objectives of crime investigation, with special focus on detection of physical evidence at rape crime scenes. The BBFD dog is trained to detect minute amounts of body fluid on any type or size of surface, including veld, bush areas, vehicles, carpets, grass, bedrooms, etc.

KEY TERMS

Crime scene, investigation, rape crime scenes, body-fluid, detection dog, trained, evidence, conviction

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ABBREVIATIONS

BBFD Dog	Biological Body-fluid Detection Dog
CJS	Criminal Justice System
CPA	Criminal Procedure Act
CSC	Client Service Centre
DCLP	Detective Commander Learning Programme
DNA	Deoxyribonucleic acid
FCS	Family violence, Child protection, and Sexual offences Unit
FSL	Forensic Science Laboratory
HR	Human Resources
HRD	Human Resource Development
ILAC	International Laboratory Accreditation Cooperation
ISS	Institute for Security Studies
JCPS	Justice, Crime Prevention and Security
LCRC	Local Criminal Record Centre
NGO	Non-Governmental Organisation
NI	National Instruction
NPA	National Prosecuting Authority
PCR	Polymerase Chain Reaction
RFLP	Restriction Fragment Length Polymorphism
ROC	Resolving of Crime
SAECKs	Sexual Assault Evidence Collection Kits
SAPS	South African Police Service
STRS	Short Tandem Repeat Sequence
UNISA	University of South Africa

CHAPTER 1

GENERAL ORIENTATION

1.1 INTRODUCTION

Rape is one of the crimes usually associated with women, children and other vulnerable groups (such as the elderly, persons with disabilities, and physically or mentally challenged persons), and this is one of the five top priorities of the Police Ministry (SAPS, 2013:3). The Star newspaper reported that much criticism has been levelled against the SAPS and, more particularly, the former National Commissioner, General Riah Phiyega, since rape has shown a steady increase over the past 10 years, and the rate of conviction of perpetrators has declined drastically (The Star, 2014:2). This sharp increase in rape statistics is certainly a cause of concern to all stakeholders and urgent attention is required to address this scourge. One important aid that could assist detectives in rape investigations is the BBFD, which is one of the many types of sniffer dogs at the disposal of the SAPS (SAPS, 2007:2). This dog is currently the only trained dog internationally that can detect Deoxyribonucleic acid (DNA) evidence such as blood and semen, which constitute vital evidence in rape crime scenes (SAPS, 2007:2).

Currently, there is no literature or study on the use of the BBFD Dog in rape or murder investigations, hence the researcher sees this as an opportunity to address the efficient investigation of such types of crimes, and also to create awareness of this dog. Police or working dogs are used throughout the world to aid detectives in their investigation, but this dog is unique, since it is available only in SA (SAPS, 2007:202). Currently, there is literature available on DNA and rape investigation, both locally and internationally. This study hopes to increase the reader's knowledge of the use of the BBFD Dog for detection of vital evidence at crime scenes such as rape (seeing that this is one of the most problematic crimes in SA).

The researcher was aware from the outset that literature applicable to this study (that is, on the use of a sniffer dog for rape investigation) is indeed limited, therefore this study may create awareness in both the academic world and policing or law enforcement agencies on the value of the BBFD Dog. The

researcher hopes to broaden the knowledge of detectives in order to improve their investigative skills to the benefit of rape investigations so that these will result in the apprehension and conviction of suspects.

1.2 RATIONALE OF RESEARCH (PROBLEM STATEMENT)

Creswell (2009:103) states that the research problem becomes clear when the researcher asks, “What is the need for this study?” or “What problem influenced the need to undertake this study?” Leedy and Ormrod (2010:48) state that the heart of any research project is the problem, and successful researchers will ask themselves: “What am I doing, and for what purpose am I doing it?” These questions will then prompt the researcher to gather data to resolve the problem. For this study, the researcher identified the research problem that outlines the facts pertaining to the problem and provides the rationale as to why it is regarded as a research problem, why the problem occurs, and what the suggested solution is.

During the period April 2013 to April 2014, the researcher observed that more than 80% of the rape cases investigated at the Booyens SAPS had been withdrawn from prosecution due to a lack of evidence (SAPS, 2014:2). The researcher perused the dockets that had been withdrawn in order to establish what the causes of the withdrawals were. It was revealed that these rape cases had been closed mainly because the elements of the crime could not be adequately proved.

Booyens SAPS is the biggest geographical area in the whole of the Johannesburg area, and is surrounded by vast open veld and bush areas (e.g. Wemmer Pan Dam, Nasrec and Kibler Park). Numerous rapes take place in these open veld areas, and evidence is often hard to detect, e.g. body-fluid evidence. The researcher studied the rape statistics in terms of the number of cases reported and the number of convictions for the period April 2013 to April 2014, for Booyens SAPS and also for the Gauteng Province, and it was discovered that Booyens SAPS had the highest number of rapes in the entire province (SAPS, 2014:2). The number of rapes reported for Gauteng province was 9230 cases, and that of Booyens SAPS was 106 cases (SAPS, 2014:2), with a conviction rate at Booyens SAPS of less than 20%.

The researcher also discovered that the impact of such low conviction rates has probably led to an increase in the number of rape cases in this policing precinct during the same period. This is attributed mainly to the fact that serial and repeat offenders were getting off the hook too easily. It therefore became clear that the SAPS members and detectives lack knowledge of how to gather valuable evidence and information in order to effect a successful prosecution in rape cases. It was also apparent that they lack knowledge of the technique on how to gather this valuable DNA evidence. The researcher, by doing a docket analysis, discovered that the detectives were not utilising the BBFD Dog as an aid to possibly detect forensic evidence at the rape crime scenes (e.g. human blood or semen) (SAPS, 2014:1). The dog had been used in only a handful of cases. In the 106 reported rape cases, the BBFD Dog had been called out for only 10 cases, which means less than 10% utilisation.

This research was important in order for investigators to realise the importance of utilising the BBFD Dog in the investigation of rape cases, since there is a problem regarding the low number of arrests and convictions in these rape cases, due to a lack of evidence. This research also highlighted what tools or aids are available to assist investigators and other SAPS members to obtain this evidence in order to gain more convictions and bring down the number of rapes in this area. One such tool or aid that is available to SAPS members is the BBFD Dog. This research showed why detectives do not make use of the dog at the rape crime scenes, even though amazing success was recorded when this dog was used at such crime scenes (SAPS, 2007:3). The Provincial Commissioner of Gauteng province issued a provincial instruction in 2010 that all murder and rape scenes have to be attended by the BBFD Dog and its handler to gather evidence (SAPS, 2010:1).

1.3 AIM OF THE RESEARCH

De Vos, Strydom, Fouché and Delpont (2011:94), Gray (2014:53) and Mills and Birks (2014:204) are all of the opinion that aims are a statement of intent and what the researcher plans to achieve. The aims provide direction for the research.

The authors mentioned above further state that the aim is the most important aspect of the research, especially for a qualitative study, where the intention of the

researcher is revealed to the readers. Leedy and Ormrod (2010:48) state that after the researcher has identified the research problem, it must be articulated in a carefully phrased manner, and present the single goal of the total research effort. The researcher submits that a simplified way to identify the convergence between the aims of research indicated by De Vos et al. (2011:94), Gray (2014:53) and Mills and Birks (2014:204) is to rely on the viewpoint of Karloff, Dan and Dietz (2008:26), who state that there is no single approach to doing research, just several different angles from which to approach it. The aim of this research was to determine how the BBFD Dog could assist detectives in the investigation of rape cases.

1.4 PURPOSE OF THE RESEARCH

According to Creswell (2009:111), the statement of purpose of any study indicates why the researcher wants to do the study and what he/she wishes to accomplish. Singleton and Straits (2010:107) believe that the researcher should indicate whether the study is exploratory, descriptive, explanatory, analytical or predictive. There must be a reason for doing research, according to Denscombe (2010:11), who further states that research serves many purposes, such as describing problems and explaining matters. This application could be meant to analyse, evaluate or improve existing procedures. In this study, the application is applicable in that we have an existing forensic investigation process in the SAPS, but the study will show how this process could be improved to enhance the ability and performance of police officials performing this function, that is, to properly investigate cases of rape.

It is important to note that Denscombe (2010:11) also states that the other purpose of research is to make predictions about future behaviour, and to empower those involved in the research. The purpose of this research entails the following:

- Evaluation of the situation:
The researcher evaluated the techniques that the detectives of the SAPS used for rape investigation, with the intention of determining their strengths and weaknesses, and then considering how these techniques could be improved.

- Exploration: The research explored how both local and international cases of rape are investigated, and it was discovered that the SAPS is the only policing agency that has the BBFD Dog at its disposal, hence this field will be explored extensively.
- Applied research: The researcher applied efficient knowledge, namely in respect of the use of the BBFD Dog as an investigative aid in rape cases and that would be a good practice for the SAPS to adopt. The recommendations made in this research could improve conviction rates in court (both locally and internationally).
- Empowerment of those being researched: This research broadened the knowledge of the researcher, and the information will be made available to SAPS members, especially detectives, to provide them with the latest knowledge regarding the use of the BBFD Dog for investigation of rape cases.

1.5 RESEARCH OBJECTIVES

De Vos et al. (2011:94), define objectives as the practical steps to achieve the aim of the research. The objective of this research was to obtain replies to the following questions:

- To determine what criminal investigation entails.
- To describe the use of the BBFD dog when used during the gathering of DNA evidence in rape investigations.

1.6 RESEARCH QUESTIONS

Mills and Birks (2014:204), Punch (2014:76) and Salkind (2012:44) state that research questions are the expression of interest and intent. Leedy and Ormrod (2010:56) state that research questions provide guidance to the researcher regarding what kinds of data to collect, and how to analyse and interpret the data. For this research, the questions under investigation were as follows:

- What does criminal investigation entail?
- How is a BBFD Dog used during the gathering of DNA evidence in rape investigations?

1.7 DEMARCATION OF THE STUDY

This study was limited to the Booyens SAPS and focused on the crime of rape and the use of the BBFD Dog for gathering physical evidence, namely semen and blood at those scenes. This study covered the period April 2013 to April 2014, in respect of rape cases that were reported at the Booyens SAPS. It is the view of the researcher that this timeframe was adequate for research purposes, as it covered one entire financial year.

The researcher focused this study on the location where the rape took place and not on the body of the victim or perpetrator, since evidence could easily be detected on either of these persons. According to National Instruction 3/2008 the SAPS is mandated to investigate all cases of rape (SAPS, 2013:2). As a result, this study will focus on the use of the BBFD Dog for investigation of rape cases. This study also refers to a pilot K9 training programme, which was presented by Captain Bokka Nel of the SAPS and took place in order to train 4 BBFD Dogs. (The pilot training programme should not be confused with this research).

1.8 DEFINITION OF KEY TERMS

According to Leedy and Ormrod (2010:58), a formal definition comprises three parts, namely (a) the term to be defined, (b) the general class to which the concept being defined belongs, and (c) the specific characteristics or traits that distinguish the concept being defined from all other members of the general classification. Leedy and Ormrod (2010:58) further state that the term must be defined operationally, meaning that it must be defined in terms of how it will be measured in the research study. For this research, the following key concepts are defined:

1.8.1 Forensic investigation

Smith and Zinn (2015:443) state that forensic investigation is the practice of lawfully establishing evidence and facts that will be presented in a court of law or at another form of hearing or tribunal.

1.8.2 Crime scene

The scene of the crime is the centre of the forensic world, where everything starts, and is the foundation upon which all subsequent analysis is based (Houck & Siegel, 2011:32).

1.8.3 Criminal investigation

This is the collection of information and evidence for identifying, apprehending and convicting suspected offenders, and includes the reconstruction of a past event (Osterburg & Ward, 2010:5).

1.8.4 Rape

The SAPS Training Manual, “Resolving of Crime” (SAPS, 2009:52) defines rape as per the new (Sexual Offences and Related Matters) Amendment Act, 2007 (32 of 2007). Section 3 of the Act states that a person is guilty of rape if he or she unlawfully and intentionally commits an act of sexual penetration with a complainant, without his or her consent. The Act provides that either a man or a woman may be the victim or perpetrator of rape.

1.8.5 Biological body-fluid detection dog

SAPS (2007:2) defines a BBFD Dog as sniffer dog that has been trained to detect human blood and/or semen that is left at a crime scene. The ability of the dog to detect very limited and invisible amounts of these body-fluids provides an aid to a crime scene examiner to detect these body-fluids that are invisible to the human eye and/or undetectable by means of the normal crime scene investigation tools.

1.9 RESEARCH APPROACH AND DESIGN

According to De Vos et al. (2011:143), a research design focuses on the end product and all the steps in the process to achieve the anticipated outcome. Flick (2011:89) and Ritchie, Lewis, Nichollis and Ormston (2014:48-70) state that a

research design is a plan or complete strategy or blueprint of how the researcher intends conducting the research and how he/she will go about addressing the research questions. The researcher has to conduct fieldwork and gather information in order to address all the research questions. Denscombe (2010:100) states that a research design explains how the key components of the research link together, explains the logic of the research process as it moves from phase to phase, and also explains how the data collection and analysis are consistent in terms of the general philosophy reflected.

For this study, the researcher used a qualitative approach in an empirical research design because the production of knowledge and the practical answers to the research problem were based on the experience, knowledge and ideas of the participants (Creswell, 2013:69; Flick, 2011:89 and Mills & Birks, 2014:182). According to Leedy and Ormrod (2010:94), the qualitative research approach focuses on phenomena that occur in their natural setting. It involves the study of phenomena in all their complexity. This study took the form of empirical research, as the researcher made use of interviews and analyses of secondary data sources. Interviews were conducted with participants who had experience in rape investigations, or who were dealing with rape cases, since the literature could not provide answers to all the questions. A further reason for using this type of research was that not much research had been done on this topic (i.e. the use of a police dog to gather evidence), hence the qualitative method was best suited to the topic, since the BBFD Dog (and the dog handlers) were readily available to the researcher. One challenge facing the researcher was the negligible amount of information and/or few literature sources in respect of this topic (the BBFD Dog), therefore information and data had been gathered from the interviews.

1.10 TARGET POPULATION

De Vos et al. (2011:223), state that “population” is a term that sets boundaries for the study unit, referring to individuals in the universe who possess specific characteristics. The ideal population for this research consisted of detectives from the SAPS who are involved in the investigation of rape cases, forensic analysts at the forensic lab who analyse DNA evidence, and also the BBFD Dog handlers. It

was impractical and uneconomical to consult or interview the total population of police officers, since the population was way too large and too widely distributed.

According to Welman, Kruger and Mitchell (2007:52), the target population consists of individuals, groups, organisations, human products and events, or the conditions to which they are exposed. According to Maxfield and Babbie (2014:186), a target population or study population consists of all the elements from which the sample for interviewing is actually selected.

The target population for this study included detectives from the 5 cluster stations within the Booyens policing precinct. The selected stations are situated in the province of Gauteng, and employ one hundred and eight detectives. The researcher selected this particular police station or 5 cluster stations in the Booyens policing precinct as it was cost-effective, due to the fact that it is the area where the researcher resides, and the place where the problem was identified. Five of the active BBFD Dog handlers were selected from Gauteng, North West, Free State and Mpumalanga provinces. The number of BBFD Dog handlers around the country is very small and they are distributed across a large area. These stations were selected since they were in close proximity to the researcher. It was not possible to select 5 K9 handlers from a single province, since no province has that many BBFD K9 handlers.

The forensic analysts are from the SAPS Forensic Science Laboratory (FSL) in Pretoria. The reason for choosing this target population is that they were in close proximity to the researcher in Pretoria, and this choice resulted in less cost and travel, since the interviews required one-on-one interaction with the participants.

1.11 SAMPLING

According to De Vos et al. (2011:224), the major reason for sampling is feasibility. Complete coverage of the entire population (detectives, K9 handlers and forensic analysts) is seldom possible, and not all the members of a population of interest can possibly be reached. Social Research Methods (2015:9) describe sampling as the process of selecting units (i.e. people) from a population so that by studying the sample we may generalise our results to include the population from which they were chosen. This is a form of probability sampling. Leedy and Ormrod

(2010:205) state that there are primarily two types of sampling, namely probability sampling and non-probability sampling. For this study, the researcher made use of the following two probability sampling techniques, namely simple random sampling and systematic sampling.

Leedy and Ormrod (2010:205) state that simple random sampling entails choosing a sample in such a manner that each member of the population has an equal chance of being selected from the population from which it was drawn. De Vos et al. (2011:230), describe systematic sampling as being similar to random sampling, but it entails having some system in the selection of the participants, e.g. the use of a random table.

For this research, the list of the names constituting the target population was easily available and accessible to the researcher through the SAPS Persap database on the computer system and the name-lists of personnel at the various units (SAPS, 2015:1). Due to the complexity of the target population for this study, the researcher used a combination of the simple random-sampling method and the systematic random-sampling method, as indicated by Leedy and Ormrod (2010:205) and De Vos et al. (2011:230).

The researcher targeted detectives from the Johannesburg policing area (which includes Booyens SAPS), and 20 participants were chosen. The researcher obtained the name lists of detectives from the 5 cluster stations within the Booyens policing precinct, using the SAPS Persap system, which contained one hundred and eight names (SAPS, 2015:1). Using this name list, the researcher then sorted the surnames in alphabetical order and allocated a number to each name, starting from No. 1 until the last name. To apply the systematic random-sampling method to this list, the researcher divided 108 by 20, which equals 5,4, and the first number between 1 and 5 was randomly selected, using the Random Number Calculator for the detective target (Leedy & Ormrod, 2010:205). To get a starting point on the list, the researcher divided 108 by 20 and the answer was 5 (rounded off from 5,4). The researcher then took 5 pieces of paper, numbered them from "1" to "5," placed them all in a box, and shook it. The researcher then drew one piece of paper, which was the number 4. Number 4 on the list was then

used as the starting point. After number 4, the researcher selected every fifth number until he had 20 numbers.

For the forensic analysts, a sample of 6 forensic analysts were selected from the Forensic Lab in Pretoria, using the systematic random-sampling method. The researcher obtained the names of forensic analysts from the forensic lab, i.e. those who deal with DNA analysis or cases, ninety six personnel. Using this name list, the researcher then sorted the names in alphabetical order according to the surnames and allocated a number to each name, starting from No. 1 until the last name. To apply the systematic random-sampling method, the researcher divided 96 by 6, which came to 16, as indicated by Leedy and Ormrod (2010:205). To prevent possible human bias, as referred to by Leedy and Ormrod (2010:205), the first number between 1 and 16 was selected for the forensic analysts. To get to the starting point, the researcher divided 96 by 6 and the answer was 16. The researcher then took 16 separate pieces of paper, numbered each from “1” to “16,” placed all in a box, and shook it. The researcher then drew one piece of paper, which was the number 8. Number 8 on the list was taken as the starting point. After number 8, the researcher selected every 16th number until he had six numbers.

To select the 5 K9 handlers the researcher used the simple random-sampling method. In this case, the researcher again used the SAPS Persap system to obtain the names of the active BBFD K9 handlers from Gauteng, North West, Mpumalanga and Free State provinces. There were fifteen handlers in these 4 provinces, and the researcher used the simple random-sampling method to list these handlers and choose 5 from the list of 15. The 5 names were all placed in a box and 5 of the 15 names were drawn. The reason why this method was applied was because the target population was much smaller.

The target population for this study thus consisted of three sample groups of participants for the interviews who were used for this research, namely:

- Sample A comprised the 20 detectives from the Booyens SAPS Cluster, meaning that a sample of 20 was

selected from one hundred and eight detectives in the population group (using the systematic random-sampling method).

- Sample B comprised the 6 Forensic Analysts from the SAPS Forensic Laboratory in Pretoria, meaning that a sample of 6 was selected from ninety six analysts from this population group (using the systematic random-sampling method).
- Sample C comprised the 5 BBFD Dog handlers from Gauteng, North West, Mpumalanga and Free State provinces, meaning that a sample of 5 was selected from 15 K9 handlers in the population group (using the simple random-sampling method).

1.12 DATA COLLECTION

Creswell (2013:145) describes data collection as the process of getting permission, gathering information, and using various methods and strategies such as recording digitally or on paper. It also involves the storage of this data, and addressing ethical issues that may arise from gathering or using the data. Creswell (2013:146) defines data collection as a series of interrelated activities undertaken for the purpose of gathering information in order to address research questions. Creswell (2013:159) states that there are four types of data, namely:

- Observations: Here the researcher gathers field notes by means of observations.
- Interviews: It includes structured or unstructured interviews, with open-ended or closed questions.
- Documents: These include all literature, i.e. data from books, journals, the Internet, and the library.
- Audio-visual materials: These include all data that is collected by means of videos, text messages, twitter and other social media etc.

For this research, literature, case docket analysis, interviews and personal experience were used as a means of data collection. This method applied by the researcher is known as triangulation, as suggested by Leedy and Ormrod (2010:99), who explain that triangulation refers to multiple sources of data that are

collected in the hope that they will all converge to support a particular hypothesis or theory.

1.12.1 Literature

Kumar (2014:18) highlights the functions of a literature review as follows: it provides a theoretical background to your study; helps you to establish the link between your proposed research and what has already been studied, and enables you to show how your study has contributed to the existing body of knowledge in your field. De Vos et al. (2011:328-340) and Leedy and Ormrod (2010:146) assert that literature refers to all available research on a subject or a topic.

Claremont Graduate University (2008:1) states that the main purpose of a literature study is that, it is an integral part of graduate studies and helps you to become fully conversant with a topic area, it may present the big picture or just an overview of significant work done on a topic, and so prevent duplication of work already done. The researcher obtained information from the UNISA and SAPS libraries in Pretoria, by consulting books on this topic. Being a member of the SAPS and based at the head office training department, the researcher had access to most of the training material that was used as a source of information. The researcher also accessed information from the Internet in the form of journal articles and other relevant literature on the topic.

Flick (2011:35) states that empirical literature entails a study about previous research in the field of your study or of similar fields. This study concentrated mainly on the use of the BBFD Dog in the investigation of rape cases, where the role of the dog was fully described. It also shows what an important tool this dog could be to a detective for collecting valuable evidence at the rape crime scene. During the literature search and gathering of information, the researcher noted that there was no other research on this topic. The researcher conducted a search on several Internet sites such as www.google.com; www.yahoo.com; news media Web sites; South African Government Information; www.wikipedia.com and www.saps.gov.za. During interaction with detectives and other role-players when doing this research, the researcher ascertained that there is a definite need for research on the topic.

The literature that was used for this study is all relevant to the topic, thus ensuring validity. Due to the fact that there was little or no literature available on the same topic as this research, and for the purpose of finding more and relevant material, it was decided that the topic should be divided into different sections that were identified for the purpose of finding literature, namely:

- What is understood by the term “Biological Body-fluid Detection Dog?”
- What is the value of using a Biological Body-fluid Detection Dog in the investigation of rape cases?

1.12.2 Interviews

De Vos et al. (2011:342), state that for a qualitative study, interviewing is the leading mode of data or information collection, and the interview is a social relationship designed to exchange information between the participant and the researcher. For the purpose of this study, semi-structured interviews were used. Leedy and Ormrod (2010:148) state that in qualitative research studies, interviews are rarely as structured as the interviews conducted in a quantitative study. The interviews are more open-ended or semi-structured. The latter, according to Leedy and Ormrod (2010:148), revolve around a few central questions.

A copy of the interview schedule is attached to this study as Attachment A. The researcher used 3 sample groups for this study. Sample A comprised 20 detectives, Sample B was 5 BBFD Dog handlers, and Sample C was 6 forensic analysts. The same interview schedule was used for all three of these sample groups. The interview schedule was piloted by using a test group of 3 police officers who were not part of the selected group of thirty one participants who were interviewed, as stated by (Leedy & Ormrod, 2013:92).

De Vos et al. (2011:342) and Mills and Birks (2014:188) mention that researchers use semi-structured interviews to get a detailed picture of a participant’s beliefs about, or perceptions or accounts of, a particular topic. The interviews were conducted face-to-face and the interview schedule comprised open-ended questions relevant to the research question. The reason for the use of open-ended

questions was that it allowed the participants to reply in more detail to the questions posed.

The questions were structured in such a way that addressed the research problem, and the researcher ensured reliability and validity by recording the interviews. The researcher followed the guidelines given by Leedy and Ormrod (2010:149-152) for conducting a productive interview:

- Made sure that interviewees were representative of the group; the researcher interviewed participants who were detectives, forensic analysts and K9 handlers.
- Found a suitable location: All interviews were conducted in offices with locks and keys. This ensured that there were no interruptions and distractions, and the place was quiet and peaceful.
- Obtained written permission: The researcher ensured that written permission was obtained in advance by forwarding consent forms to all participants, asking them to sign and agree to an interview. These are all filed together with the interview schedule for record purposes (Attachment A). Permission was also obtained from the commanders of the participants (Annexures A, B, C, D and E).
- Do not put words in people's mouths. At no stage during the interviews did the researcher suggest or try to change the manner in which the questions were answered. The actual words spoken by the participants in response to questions were recorded.
- All interviews were recorded. The researcher ensured that answers to all questions were captured on tape.
- The researcher ensured that the identity of participants was kept confidential, therefore the term "participant" was used in the research rather than stating the names of participants.

1.12.3 Case docket analysis

The researcher had easy access to the reported rape cases or dockets and detectives within the Booyens SAPS area, since he is also a member of the

SAPS and of the task team set up to improve service delivery at this station (SAPS, 2013:2). Permission was obtained to utilise data from these dockets, in accordance with the letter of permission from the Provincial Commander of Gauteng (refer to Annexure C). Therefore, the docket analysis of the reported rape cases at Booyens SAPS was also a data-collection method.

The docket analysis was in respect of rape cases reported during the period April 2013 to April 2014, and these were the dockets that had already been closed or finalised. The researcher listed the dockets for this period (106 reported rape cases) and, using the systematic random-sampling method, chose 20 dockets from the list to conduct the docket analysis. The use of 20 dockets for purpose of this research was sufficient to make a finding, since other methods of data collection was also used, namely, literature, interviews and personal experience. The researcher sorted the 106 dockets in date order of occurrence of the crime, and allocated each a number, from 1 to 106. The systematic random-sampling method was then applied, where 106 was divided by 20, which equals 5,3, and every fifth docket was chosen. To get a starting point on the list, the researcher divided 106 by 20, and got 5 (rounded off from 5,3). The researcher then took 5 pieces of paper, numbered them from “1” to “5,” placed them in a box, and shook it. He then drew one piece of paper, which was the number 2. Number 2 on the list was then used as the starting point. After number 2, the researcher selected every 5th number until he had a total of 20 numbers.

The data that the researcher looked for in these dockets included the following:

- The use of forensic experts to gather evidence at the crime scene and what method or aids were utilised to collect the evidence.
- What evidence was collected, and how it was discovered.
- Analysis of the collected evidence in the forensic lab, and results of the analysis.
- Whether the BBFD Dog was used in any of these rape cases.

- Whether there were arrests for each case, and/or the results of court cases (guilty or not guilty).

1.12.4 Personal experience

The researcher also used his personal experience in the field of K9 training and visible policing to interpret and evaluate the information and data gathered for this study. The researcher has had 26 years of experience in the SAPS, of which 13 years were at Head Office Training, where he managed all K9 training nationally, as well as specialised Vispol training, among other things. The researcher has a BTech Degree in Policing from Unisa, an Honours degree (Cum Laude) in Education and Training from North West University, and is currently engaged in this Master's degree study in Forensic Investigation. He has also successfully completed various internal training courses in the SAPS and has been involved in numerous projects throughout the SAPS, through which he gained valuable experience and exposure to various facets of policing.

1.13 DATA ANALYSIS

According to De Vos et al. (2011:397), data analysis is the process of bringing order, structure and meaning to a mass of collected data. Creswell (2013:182) and Leedy and Ormrod (2010:153) describe a "data analysis spiral," which is applicable to a wide range of qualitative studies. This spiral procedure entails using data to form the basis of research study by taking the following steps:

- Organise the raw data: The researcher organised the data by dividing it into smaller segments and created a computer database in Excel format to list all the responses of participants.
- Peruse the data: The researcher had to know what the data contained, therefore, the selected dockets and responses of the participants in the interviews were studied, and the results summarised in a table format.
- Classify and analyse the data: The researcher grouped the data into categories or groups and started his analysis.

- Synthesise the data: The researcher integrated and summarised the data and presented a final report.

1.14 METHODS TO ENSURE VALIDITY

According to Leedy and Ormrod (2010:28), validity of an instrument is the extent to which it measures what it is supposed to measure. De Vos et al. (2011:173), believe that the definition of validity presents two aspects: (1) that the instrument actually measures the concept in question; and (2) that the concept is measured accurately. It is possible to have the first without the second, but not vice versa, meaning a concept cannot be measured accurately if some other concept is being measured instead.

The researcher used the aims of the research and the research questions in the interview schedule as a guideline to obtain and gather the relevant literature. In this instance, interviews were conducted with experienced detectives within the SAPS environment, and documents were used to gather data for the research. The literature was from old and new (current) sources, therefore this indicated valid data. The sources where literature was obtained from were properly referenced by means of the list of references, and in the prescribed manner for quoting sources from literature.

Marshall & Rossman (2011:40) came up with alternative constructs to capture qualitative validity and reliability, namely credibility, dependability, conformability and transferability, compared to the more traditional quantitative criteria, which include internal validity, external validity, reliability and objectivity. The credibility and transferability will hence be discussed.

1.14.1 Credibility

Social Research Methods (2015:12) emphasise that credibility involves that the results of qualitative research must be credible or believable from the perspective of the participants in the research. Du Plooy-Cilliers, Davis and Bezuidenhout (2014:258) refer to credibility as the accuracy with which the researcher interpreted the data that was provided by the participants. The following validation strategies, as suggested by Creswell (2013:251), were applied in the study:

- Triangulation: This is when the researcher makes use of various sources and methods to corroborate evidence. In this case, the researcher used the literature (books), interviews, SAPS material, crime statistics and actual rape case dockets to gather data.
- Member checking: This is when the researcher determines the accuracy of the findings by taking the final report back to the participants to determine whether they feel that it is accurate. The researcher had a meeting with 14 of the detective participants and gave feedback to them on the findings, and all agreed on the findings. Only these 14 of the 20 participants were available for this session.

A similar feedback session was held with the 6 forensic analyst participants and they agreed with the findings. The feedback to the 5 BBFD K9 handlers was done via e-mail, and all agreed with the findings.

- Rich, thick description: The researcher used a rich, thick description to convey the findings to participants by providing a detailed explanation of the research setting and the participants involved in the study. The participants were the detectives from the Booyens SAPS, K9 handlers and forensic analysts, and they were given the findings of the research.

1.14.2 Transferability

Transferability refers to the degree to which the results of qualitative research can be generalised, or transferred to other contexts or settings. From a qualitative perspective, transferability is primarily the responsibility of the one doing the generalising (Social Research Methods, 2015:12). Universal Teacher (2015:3) defines transferability in the qualitative context as the degree to which the results of a research can apply or be transferred beyond the bounds of the project. It is also essential that an adequate thick description of the phenomenon under study is given to allow the reader to attain proper understanding of it, and to allow them to compare the instances of the phenomenon explained in the research study with those that they have seen emerging in their own situations. For this study, the researcher hoped for the audience to recognise the important role that the BBFD Dog can play in the investigation of rape, compared to instances where the dog was not used.

1.15 METHODS TAKEN TO ENSURE RELIABILITY

Du Plooy-Cilliers et al. (2014:258) and Maxfield and Babbie (2014:129) agree that reliability means that the results obtained must be replicable if the same research is conducted by another researcher. In other words, another researcher doing this same research will arrive at the same result or conclusion. Du Plooy-Cilliers et al. (2014:253), further state that the aim of a qualitative study is to promote understanding of a particular phenomenon within a specific context, and not to generalise.

All relevant resources utilised by the researcher for this study are still available for control purposes, and permission was granted to use confidential documents, such as SAPS training material. Permission to conduct interviews was obtained from the SAPS Head Office and the participants. The researcher also ensured that the participants were experienced and skilled members in their respective fields, and that their personal points of view were taken into consideration. The literature used for this research was current, and had been updated and corroborated by various writers in the field.

The researcher is confident that reliable measures had been used throughout this research, and that his actions had been taken to the best of his abilities. This includes ensuring that if the same methods of research had been used by another researcher, the same results would have been achieved. To ensure reliability, the researcher also ensured dependability and confirmability of this study, which are discussed below.

1.15.1 Dependability

Du Plooy-Cilliers et al. (2014:259), state that dependability refers to the quality of the process of integration that took place between the data-collection methods, data analysis and theory generated from the data.

To ensure reliability, the researcher kept recordings of all interviews in both digital and written form, and also kept a comprehensive record of how data was collected, how interviews were conducted (i.e. using the same questions), and how data was analysed. All of these data are kept safely under lock and key by

the researcher. This study was reviewed by the researcher's peers to identify shortfalls or challenges, and the researcher's supervisor in turn reviewed the entire process to ensure overall validity of the study.

1.15.2 Conformability

According to Social Research Methods (2015:12), conformability refers to the degree to which the results could be confirmed or corroborated by others. Du Plooy-Cilliers et al. (2014:259), refer to conformability as to how well the data collected support the findings and interpretation of the researcher. To achieve conformability, the researcher employed the member-checking strategy, as suggested by Creswell (2013:251), by returning interview schedules and a draft of the final report to the participants to ensure that their views had been represented accurately. This was done to determine inaccuracies and maintain objectivity.

1.16 ETHICAL CONSIDERATIONS

According to Unisa's *Policy on Research Ethics of the University of South Africa* (University of South Africa, 2007:7), researchers should respect and protect the dignity, privacy and confidentiality of participants. The researcher adhered to Unisa's code of conduct for researchers. Ethical guidelines serve as standards and the basis upon which each researcher ought to evaluate his/her own conduct, as described by De Vos, Strydom, Fouché and Delport (2007:24).

In this research, the approval of the SAPS was obtained prior to the research and interviews with personnel. The researcher also took into account the SAPS National Instruction 1/2006, in which research is regulated, and followed the process via the SAPS Research Division. The researcher received written approval from the following SAPS Head Office Divisions and Provinces, and the official SAPS approval letters from these respective divisions and provinces are attached as Annexures below:

- Division Forensic Services –
Annexure A.
- Division Visible Policing –
Annexure B.

- Provincial Commissioner
Gauteng – Annexure C.
- Provincial Commissioner
North West – Annexure D.
- Provincial Commissioner
Mpumalanga – Annexure E.

In addition to SAPS approval, the researcher was also granted approval by the Unisa Ethics Committee. The official Unisa College of Law Ethics Committee letter is attached as Annexure F. The following ethical guidelines were adhered to during this study:

1.16.1 Protection from harm

The names of participants were not revealed, in order to protect them from any unnecessary physical or psychological harm, thus they were referred to as “participants.” The researcher also ensured that the necessary permission was obtained prior to conducting any interviews, and that the interviewees were provided with sufficient information on the research being conducted.

1.16.2 Informed consent

The researcher informed the participants in advance of the purpose and nature of the research, which allowed them to make an informed decision whether to participate or not. Written consent was obtained from each participant who was selected to be part of the sample of participants, and they agreed to be interviewed. The interviews were conducted at their convenience and at suitable venues chosen by the researcher. The researcher reported his findings honestly, based on interviewees’ responses. Refer to the attached Attachment A for the informed consent form.

1.16.3 Acknowledgement of sources

All sources cited were duly acknowledged to ensure that no plagiarism had been committed. Appropriate references were made to every author quoted in this research, and the researcher acknowledged the literature by including a comprehensive list of references at the end of this research document.

1.16.4 Confidentiality

Confidentiality was guaranteed, since the names of the participants remained anonymous. Interviews were conducted at participants' workstations, privately and individually.

1.16.5 Right to privacy

The right to privacy of participants was respected and maintained. According to Leedy and Ormrod (2010:120), participants should not participate in research that could cause them embarrassment.

1.17 RESEARCH STRUCTURE

The research is set out in a research report, which is provided after the chapter layout below.

Chapter 1: General orientation

This chapter focused on the methodology that was followed in this study.

Chapter 2: Criminal investigation

The researcher described criminal investigation and its objectives, the role of the SAPS in criminal and forensic investigation, the crime of rape, as well as the evidence that might be found at a rape crime scene, including DNA evidence.

Chapter 3: The use of a Biological Body-fluid Detection Dog during the gathering of DNA evidence in rape investigations

Here the researcher highlighted how the BBFD Dog can be used for gathering DNA evidence at rape scenes. The main focus was to show the brief time it took the dog to point out the evidence, and also to prove that evidence can be detected by the dog in almost any surroundings or area. The researcher furthermore discussed the value that the BBFD Dog added, both to the detectives and the personnel from the forensic services.

Chapter 4: Findings and Recommendations

This chapter reflects the findings of the research study and the recommendations for implementation of the findings, with suggestions for further research.

CHAPTER 2

CRIMINAL INVESTIGATION

2.1 INTRODUCTION

“Rape victims laughed at and chased away from the Booyens police station in Johannesburg” (Eye Witness News, 6 June 2017).

A recent complaint to Eye Witness News by the Soul City Institution for Social Justice on the victimisation of rape victims surfaced at the Booyens SAPS, where it was alleged that police officers on duty refused to open cases of rape for victims. Instead, they taunted and teased the victims and chased some away. This resulted in the Soul City Institution deciding to hold a night vigil awareness campaign outside the Booyens SAPS (Eye Witness News, 6 June 2017).

During the period April 2013 to April 2014 the researcher observed by means of the docket analysis that more than 80% of the rape cases that had been opened and investigated at the Booyens SAPS had subsequently been withdrawn from prosecution (SAPS, 2014:2). The researcher perused 20 of the 106 dockets that were opened for that period. The conviction rate for the cases that went to court was less than 20% (SAPS, 2014:2). The reasons for such a high withdrawal rate and a low conviction rate of perpetrators are not conclusive, but the researcher will argue that the situation might be due to a lack of evidence for presentation in court in these cases.

This chapter will endeavour to answer the research question, namely: “What does criminal investigation entail?” as reflected in paragraph 1.6 of Chapter 1. The researcher will describe criminal investigation and its objectives, as well as the role of the SAPS in criminal and forensic investigation, and he will then describe the crime of rape and the evidence that might be found at a rape crime scene. Focus will be on body-fluid evidence such as blood and semen, which are the most common types of evidence at a rape crime scene.

2.2 CRIMINAL INVESTIGATION

Stelfox (2009:7) states that crime is first and foremost about how people behave towards each other, and so it has always been a feature of the human experience. According to Gilbert (2007:33), criminal investigation is a logical, objective and legal inquiry involving a possible criminal activity. The SAPS has a legal obligation to identify, individualise and apprehend criminals, as prescribed in section 205 of the Constitution of South Africa (108 of 1996), and outlined further in section 13 of the South African Police Act (65 of 1995). Greene (2007:356) states that criminal investigation is the reconstruction of a past event, through which police personnel solve crimes. The detectives or other investigative personnel take numerous factors into consideration when reconstructing a case, in order to determine who committed the crime and under what circumstances (Greene, 2007:356). Lochner and Zinn (2015:32) describe crime investigation as the locus of a scene where a crime took place; the scene is any place where a crime is committed and where it is likely that legal proceedings will occur.

Stelfox (2009:1) state that criminal investigation involves locating, gathering and using information to bring offenders to justice, or achieving one of the other objectives set for it by the police service, such as victim care, intelligence gathering, or managing crime risks. Bennett and Hess (2007:06) state that criminal investigation is the process of discovering, collecting, preparing, identifying and presenting evidence, to determine what happened and who is responsible. Palmiotto (2013:4) views crime investigation as a process whereby the investigator assembles documents and evidence, and reviews the facts, evaluating every detail of the crime scene carefully and systematically. The facts gathered must then be linked to the crime. Palmiotto (2013:4) adds that in order to bring an investigation to a successful conclusion, the investigator creates hypotheses that link one fact to another and then, by linking the hypotheses, constructs a theory that explains the crime as a whole. According to Gardner (2012:3), the purpose of criminal investigation, first and foremost, still remains a search for the truth. The police seek to objectively define what happened and who was involved, and to do so in a manner that is lawful and does not violate the rights or liberties of those being investigated.

The researcher will discuss in this chapter the role and significance of criminal investigation in rape cases. This chapter will focus on forensic science in general, and forensic science in the SAPS, as well as the role of the SAPS in criminal investigation, the crime of rape, a crime scene, and evidence at a crime scene. The aspect of DNA evidence, and the importance and use of DNA evidence to prove cases of rape will be discussed. All these aspects are part of the criminal investigation process, as described by Gilbert (2007:33), Greene (2007:356), Lochner and Zinn (2015:32), Palmiotto (2013:4) and Stelfox (2009:7) and will be further highlighted in paragraph 2.2.1 below, which deals with the objectives of crime investigation.

2.2.1 Objectives of crime investigation

Benson, Horne and Jones (2015:13) state that the objectives of an investigation are to establish that a crime has actually been committed, to identify and apprehend the suspect(s), to recover stolen property, and to assist in the prosecution of the person(s) charged with the crime. Osterburg and Ward (2010:5) describe the objectives of criminal investigation as the collection of information and evidence for identifying, apprehending and convicting suspected offenders. This includes reconstruction of a past event. Osterburg and Ward (2010:5) further add that it includes the discovery of all facts pertaining to the case, gathering and preserving physical evidence, and presenting testimony or evidence in court. Stelfox (2009:2) differs slightly from the other writers in that he adds that the objectives of criminal investigation have changed. At one time, its sole purpose was to bring offenders to justice, and an investigation was shaped only by the need to identify suspects and gather evidence to support prosecutions. Nowadays, victim care, community reassurance, intelligence-gathering, disruption of criminal networks, and managing a wide range of crime risks are also seen as fundamental objectives of the process (Stelfox, 2009:2).

Bennet and Hess (2004:5), Gilbert (2007:33) and Osterburg and Ward (2010:6-9) list the objectives of criminal investigation as follows:

- **Identification of the crime:**
Identification of the crime concerns determining the type of crime committed

and, if any, what kind of information or clues can possibly be collected. The crime situation must therefore be identified not only in accordance with set juridical elements, but also by means of preliminary observations made at the crime scene. The information and facts gathered must therefore confirm that an act, judged by the set juridical elements of particular crimes, indeed amounts to unlawfulness, and that a specific person or persons is/are responsible.

- **Gathering evidence:** The gathering of evidence begins at the crime scene because it is the terrain containing visible and hidden information. Evidence falls into two categories, namely direct and indirect sources of information. Direct information is the actual sensory experience of people (i.e. victims or witnesses). Indirect information is also referred to as mute evidence, which comprises physical clues that reveal the circumstances of events and includes all solids and liquids through which the associative relationship of a person, weapon or vehicle to the crime or victim can be determined (e.g. blood, hair, semen, prints, etc.).
- **Supplementary information in relation to the crime scene:** Examples of this are letters, notes and any other objects or articles that could supply the crime investigator with background information.
- **Individualisation of the crime:** The emphasis of individualisation is on the involvement of the perpetrator or alleged criminal in the act committed, and based on establishing probability from the information and facts collected, that a specific person committed the crime.
- **Arresting the criminal:** Once all the relevant information and facts have been collected and the criminal has been identified, the criminal investigator can proceed to have the criminal arrested, that is, to ensure that the criminal will be present at his trial.
- **Recovery of stolen property:** This objective of criminal investigation is twofold, namely to restrict the victim's losses to a minimum and to present the recovered property as evidential material at the trial.

- Involvement in the prosecution process:** The objective is to assist the public prosecutor in the prosecution process. The investigator's involvement here lies in the presentation of the information gathered and in making sure that everyone/everything is presented in court on the trial date.

The participants chosen for this study were asked to describe their understanding of the objectives of crime investigation. The participants comprised of 20 detectives representing Sample A, 5 K9 handlers as Sample B, and 6 forensic analysts as Sample C. This question was relevant to all of these participants, since all are operational police members who deal with crime in one way or the other. This was an open-ended question to which the participants could provide their own answers and no choices were provided from which they could choose. The researcher tabled the participants' views on the objectives of crime investigation in Table 2.1 below, together with an analysis of their views.

Table 2.1: Participants' views on the objectives of crime investigation

Frequency	Participants' Views
Sample A: Detective Participants	
9	Gather information at the crime scene to arrest suspect, recover stolen goods, individualise perpetrator.
6	Gather evidence at a crime scene in order to determine the truth.
2	Any object left by perpetrator at a crime scene during rape, e.g. cigarette butt, blood, semen, hair or clothes.
1	Gather information by interviewing parties and collecting evidence.
1	People who commit crime must answer for their action in a court of law.
1	Investigation of stopping crime against women and children.
Sample B: K9 Handler Participants	
3	Collect evidence at crime scene, arrest suspect and connect him/her with crime committed.
1	Investigate suspect or crime scene to solve crime, and bring suspect to justice
1	Crime reported must be investigated and perpetrator brought to court, using all evidence gathered.
Sample C: Forensic Analyst Participants	
4	Collect evidence and information at crime scene, arrest suspect and

	preserve the crime scene.
1	Use different techniques, e.g. biology, ballistics, maths, etc. to solve a crime and prove guilt or innocence of person.
1	Determine what happened before a crime took place, during the crime, and events after the crime.

As per Table 2.1 above, there is evidence that 18 of the 20 detective participants from Sample A have a fair understanding of what the objectives of crime investigation entail. These participants included the main elements of this concept, such as gathering of information, arresting the suspect, and recovering stolen goods. Only 2 of the detective participants from Sample A gave responses that were not in line with the literature. All 5 of the participants from Sample B gave a good response to this question and seem to have sound knowledge of what the objectives of crime investigation entail. The 6 participants from Sample C responded well in respect of this concept, even though their job entails analysis of forensic evidence and not operational investigations.

The researcher noted that the majority of the participants have a fair understanding of the objectives of crime investigation, since most of them gave answers similar to what was described in the literature, although a few of them deviated into the concept of forensic investigation. The 20 detectives of Sample A are experienced, and most are employed in the specialised Family violence, Child protection and Sexual offences (FCS) unit. As per requirement of the SAPS Division Detective Services Policy, the detectives from FCS units receive additional training in rape and sexual offences investigations (SAPS, 2016:4). The Sample B participants, namely the K9 handlers, deal with and are exposed to a high level of serious and violent crimes. The Sample C participants, the forensic analysts, also deal with physical evidence that emanates from an array of serious offences. Sample A participants are the ones who have to have the best understanding of the objectives of criminal investigation, since they are operationally involved in investigations and are required to apply this knowledge and skills to ensure successful investigations. The next concept to be discussed is forensic science.

2.3 FORENSIC SCIENCE

Houck and Siegel (2011:4) describe forensic science as the science associated with people, places and things involved in criminal activities, and these scientific disciplines assist in investigating and adjudicating criminal and civil cases. Saferstein (2011:4) states that forensic science is an umbrella term encompassing a myriad of professions in the forensic science field, whether it is biology, anthropology, entomology or others. The SAPS FSL describes forensic science as the application of scientific methods in the investigation of crime and specifically the examination of physical exhibit material (SAPS, 2017:1). The word 'forensic' is derived from the Latin word 'forum,' of which one meaning is 'for the courts.' The basis of most facets of this field is the Locard Principle, which means that every contact leaves a trace (SAPS, 2014:1). Jackson and Jackson (2008:2) also believe that forensic science plays a very vital role in most serious criminal prosecutions, and they state that there are three phases in the forensic science process, from collecting physical evidence to the presentation of scientific findings in court. The three phases are as follows:

2.3.1 The recovery of the evidence from the crime scene

The crime scene is the source of information, and the most important aspect is to establish a chain of custody (Jackson & Jackson, 2008:2). Jackson and Jackson and, the SAPS Training Manual on Resolving of Crime (2009:355) also highlight the importance of the chain of custody of any type of physical evidence, in order for the evidence to be admissible in court. Jackson and Jackson (2008:2) and Van der Watt (2015:199) further assert that the chain of custody must be demonstrated in order to prove that the integrity of the physical evidence has been maintained. Lochner and Zinn (2015:14) and Van Der Watt (2015:199) further state that the chain of custody will indicate who had contact with the evidence, at what time, under what circumstances, and whether changes were made to the evidence. If any changes were made, they must be fully disclosed.

A practical example relating to the chain of custody is explained in terms of the first responder (police officer) attending a rape scene in the veld area. He calls out the BBFD K9 handler and dog to help search for biological evidence at the scene. The K9 handler and dog detect a used condom in the veld. The handler then calls

the Local Criminal Record Centre (LCRC) member to package and seal the exhibit. The exhibit is transported to the police station and handed to the Commander of the Client Service Centre, who stores it in the exhibit room. Later, the detective forwards this exhibit to the forensics lab for analysis. The forensic analyst receives this exhibit, conducts the necessary analysis, and submits the report to the detective for presentation in court. This whole process is known as the “chain of command” and the defence attorneys usually use this process to create doubt in the witnesses or to prove contamination of the evidence, according to the SAPS “Crime Scene Management Training Manual” (SAPS, 2012:18).

2.3.2 The forensic examination of evidence recovered from the crime scene

Physical evidence is subjected to scientific analysis in the crime laboratory and the results yield forensic evidence for consideration by the court (Fish, Miller & Braswell, 2011:3). Fish et al. (2011:3), further assert that there are always two versions of the event, namely the prosecution’s allegations and the defendant’s version. Jackson and Jackson (2008:3) suggest that forensic analysis of physical evidence will help to provide answers to a number of important questions and establish whether any links exist between the suspect, victim and crime scene. Forensic analysis of body-fluid evidence (e.g. blood or semen) found on a rape crime scene could also help to establish the identity of a suspect by means of DNA profiling (Jackson & Jackson, 2008:3).

2.3.3 The presentation of scientific test results in court

According to Jackson and Jackson (2008:3), the forensic scientist or analyst who was responsible for analysing the evidence has to record his or her findings in the form of a report for use in court. This report has to be thorough and easily understood by non-scientists in the criminal justice system, and in most instances, the forensic scientist has to testify in court as an expert witness. The Oscar Pretorius case in the Pretoria High Court demonstrated the importance of proper record keeping and presentation of the evidence in court. In this case a number of expert witnesses from the SAPS forensic services testified on behalf of the prosecution (e.g. ballistics experts), and also experts for the defence (such as the geologist, Roger Dixon) (The Independent Newspaper, July 2014:3). The SAPS

detectives are mandated by the SA Police Service Act to investigate cases of rape and bring such cases before a court of law.

Like Saferstein (2011:4), Orthmann and Hess (2013:8) state that forensic science covers a wide range of disciplines, which include pathology, entomology, odontology, anthropology, serology and toxicology. The detectives therefore have a wide range of experts and investigation aids available to assist in his/her investigation and should not rely on only a few. The above paragraph is an indication of the valuable role that forensic science could play for the detectives during their investigations. The many different forensic units available for various kinds of evidence are also mentioned. The next paragraph will examine the role of the SAPS in crime investigation.

2.4 ROLE OF THE SOUTH AFRICAN POLICE SERVICE IN CRIMINAL INVESTIGATION

Stelfox (2009:2) states that the police service's capacity to carry out investigations depends entirely on the knowledge, skills and understanding of the individual investigators, therefore the training and continued professional development of detectives are of the highest importance to the police service. Palmiotto (2013:6) says that a detective must be familiar with investigative techniques, sources of information, departmental policy and legal guidelines established by the courts. Section 20(3) of the Constitution of SA, Act 108 of 1996, mandates the SAPS to investigate all reported crimes, or any offence or alleged offence.

In terms of the South African Police Service Act, 1995 (68 of 1995), the SAPS is responsible for investigating all crimes committed. The detective has the greater responsibility during the investigation of crime and therefore has to investigate the cases with a high level of efficiency and professionalism. Benson et al. (2015:24), distinguish between private investigators and the police investigators, and stress that all criminal cases must be investigated by the police the moment these cases are brought to their attention. Benson et al. (2015:25), further state that one of the main differences between a police investigation and a corporate or private investigation is the way in which the investigation is recorded and presented. The police have to follow strict guidelines, while private investigators operate in accordance with client instructions or personal preference.

With reference to serious and violent crimes such as rape, the detective must conduct a thorough investigation of the crime scene and render all the necessary assistance to the victim, as mandated in the SAPS National Instruction 3 of 2008 (SAPS, 2008:1). The detective is responsible for submitting any physical evidence found at the crime scene to the SAPS FSL for forensic analysis. The detective and the forensic expert will subsequently give testimony in court, since the Criminal Procedure Act 1977 (51 of 1977) stipulates that the police are responsible for bringing any case before a criminal court (SAPS Training Manual, Resolving of Crime, 2009:70). Jackson and Jackson (2008:2) reiterate this point, where they say that the involvement of forensic science and investigation in any crime scenes starts with the collection of evidence, proceeds to the analysis of the evidence, and culminates in the writing of findings in the form of a report for court proceedings and eventually testifying.

The SAPS has a dedicated unit that deals with victims of rape, namely the FCS. The unit attends to the more serious and sensitive cases, e.g. sexual cases where children are the victims, but it is the first responder (or patrol officer) who has the first dealing or encounter with the victims. In 2006, the FCS units were restructured and these members were redeployed to police stations. The restructuring produced undesirable consequences, which had a huge impact on the quality of service provided to victims and survivors of sexual offences. In 2009, the then Police Minister, Mr Nathi Mthethwa, announced the decision to re-establish and reintroduce the FCS units (SAPS document, FCS Strategy Gauteng, 2011-2015).

The SAPS realised the mistake it made by closing down these dedicated units, and has now brought them back into full operation so that they can focus on rape investigations and family violence cases (SAPS Re-Integration of FCS Units, 2013). The FCS units are deemed a very strenuous and stressful environment to work in, according to many seasoned detectives, and mentioned in the recent press statement by the FCS Head, Brigadier Linda (SAPS, 2017:3). The detectives in these units face tragic and sensitive cases that involve babies of a few months old, to elderly citizens, says the unit's National Head, Brigadier Linda (SAPS, 2017:3). Linda further adds that to be a member of this unit requires a high

degree of commitment, passion, empathy and strong willpower from the members (SAPS, 2017:3).

From the docket analysis carried out by the researcher it was discovered that the local detectives at Booyens SAPS rarely call out the FCS members for rape cases when they are reported. From the 20 dockets that were perused, the researcher made the following discoveries regarding the issues listed below:

- The use of forensic experts to gather evidence at the crime scene and what method or aids were utilised to collect the evidence: The FCS unit was called out for only 3 of the 20 crime scenes. The Local Criminal Record Centre (LCRC) members were present at these 3 scenes, and photos were taken at 2 of the scenes.
- The evidence that was collected and how it was discovered: According to the 20 dockets perused, the victims afterwards consulted a medical practitioner for a medical examination in only 5 of the cases. In all 5 cases, physical evidence was obtained from the victims (semen samples), using the standard rape crime kits, and sent for forensic analysis.
- Analysis of the collected evidence in the forensic lab and results thereof: According to the dockets inspected there were forensic results from the forensic laboratory for only 3 dockets of the 5 that were sent for forensic analysis.
- Whether the BBFD Dog was used for any of these rape cases: The dog was called out for only 1 case. However, there was no proper record of the outcome of the use of the dog.
- Whether there were arrests for each case and/or the result in court (guilty or not guilty): For the 20 dockets perused, there were arrests in 6 of the cases. In 4 of these cases, the suspect was known to the victim, and there was a successful conviction in only 1 case.

From the above docket analysis, the researcher observed that the first responders at Booyens SAPS handle the rape scenes and fail to gather sufficient physical evidence. The reason for them not gathering evidence from the rape crime scene

could be a lack of expertise or training on how to handle the scene correctly, or merely failure to follow prescribed procedures. They call the FCS members only later on to sign for the rape dockets. Furthermore, one very crucial shortcoming of the SAPS members (and detectives in particular), is that most of the rape cases were opened by the complainants at the station's Community Service Centre (CSC). The SAPS members failed to attend the actual crime scene as part of the investigation process, and mainly relied on the complainant's oral statement. This failure results in non-collection of possible vital physical evidence (such as semen), which could be important for the case in terms of identifying or linking the suspect, and for individualising him/her afterwards. These factors are contrary to what Benson et al. (2015:24), Jackson and Jackson (2008:2), the SAPS National Instruction (3 of 2008) and the South African Police Service Act 1995 (68 of 1995) on how the police should handle a criminal investigation. The next section, paragraph 2.5 will focus on the SAPS forensic services that are responsible for the analysis of all exhibits including rape cases that are sent to the lab.

2.5 THE SAPS FORENSIC SERVICES

According to Becker and Dutelle (2013:1) and Bell (2008:88), Edmond Locard started the first crime laboratory in 1910 in Lyon, France, in order to improve criminal investigation. Becker and Dutelle (2013:11) further state that today's modern forensic laboratories have experts in the field of serology and immunology, ballistics, document analysis, fingerprints, polygraphs, chemistry and geology. The SAPS FSL was established in Pretoria on 15 January 1971. Later, decentralised labs were established in Cape Town, Port Elizabeth and Durban. The main functions of the FSL include the application of scientific principles, methods and techniques for the process of criminal investigation. In an objective search for the truth, the intention is not only to bring offenders to justice, but also to protect innocent people against prosecution (e.g. a person may be falsely accused of rape) (SAPS, FSL Website: 2017:2).

The International Laboratory Accreditation Cooperation (ILAC) is an international body that oversees, inspects and awards accreditation to labs around the world. They have strict requirements and standards that have to be complied with in order for the lab to achieve accreditation from them, e.g. calibration of machines

and equipment, and proficiency testing of personnel (ILAC document, Australia, 2002). One very important aspect highlighted by both ILAC and the SAPS FSL is that of reliability e.g., whether a test carried out by any of the trained staff at different times at the lab will produce the same result. This test is important to ensure fairness to potential perpetrators, as enshrined in the Constitution of SA, Act 108 of 1996.

One huge challenge facing the SAPS forensic services is the long time it takes to have DNA and other forensic evidence analysed. Our time frame far exceeds that of the United States of America (USA), and it can sometimes take up to twenty four months to get results from the lab. This holds huge setbacks for the resultant matter before the courts, with many good cases being scrapped, as was highlighted at the SAPS National Forensic Conference (SAPS, 2013:3). Some of the reasons for this are that South Africa forensic labs have a huge backlog of cases, shortage of staff, breakage of equipment, and poor communication between the lab and the detectives (SAPS, 2013:3).

The Division Forensic Services of the SAPS held its first historic National Conference in July 2013 at Hammanskraal, Pretoria (SAPS, 2013:1). The conference was well attended by inter alia, participants from the Justice, Crime Prevention and Security (JCPS) cluster. The Head of Forensic Services of the SAPS outlined that one of their main objectives was to establish an enhanced Human Resources (HR) capacity that will be responsible for the needs of the Criminal Justice System (CJS). The division has embarked on a huge recruitment drive and has appointed qualified forensic personnel in the various disciplines within the forensic services (SAPS, 2013:3). The total number of people of the Division Forensic Services amounts to 7 416 (SAPS, 2013:2). This number includes the development of current staff at the various labs. At this conference, the Divisional Commissioner Lieutenant General Phahlane also indicated the following appointments at the Division:

- 2011/2012 50 employees
- 2012/2013 800 employees
- 2013/2014 710 employees

The purpose of enhancing the capacity was to improve on the time it takes for analysis of exhibits, thus reducing the workload of detectives and the courts. This is the first time in the SAPS that so many analysts were recruited and trained in such large numbers. The SAPS, by augmenting the forensic labs, providing continuous training and skilling of personnel, and improving on their equipment, ensured that the turnaround times will improve.

The discussions above indicate that the SAPS has adequate forensic laboratories to conduct forensic analysis regarding the various crimes reported, although the researcher could not establish whether these labs conform to the standards of ILAC. The national forensics conference highlighted the huge challenges facing the SAPS forensic services, hence the large recruitment drive was initiated to address these problems. The next paragraph will focus on the role of forensic science in criminal investigation.

2.6 THE ROLE OF FORENSIC SCIENCE IN CRIMINAL INVESTIGATION

Palmiotto (2013:119) states that the interchangeable terms “forensic science” and “criminalistics” refer to the natural sciences such as biology, chemistry and physics, and are applied to the investigative and legal process to determine the guilt or innocence of a suspect. Jackson and Jackson (2008:5) and Palmiotto (2013:120) believe that a crime investigator needs a basic understanding of criminalistics principles in order to handle the crime scene properly and know the importance of evidence found on the scene. According to the SAPS Division Human Resource Development (HRD) Detective Training Programmes, the SAPS train their detectives in courses such as Crime Scene Management (2 weeks), Resolving of Crime course (16 weeks), FCS course (4 weeks) and Detective Commander Learning Programme (5 weeks) in order for them to master these skills (SAPS, 2014:2).

Palmiotto (2013:120) states that criminal investigators and other law enforcement personnel initiate the process of criminalistics inquiry, and the lab personnel respond only to the evidence submitted to them. The recent criminal justice seminar held in Pretoria in January 2014 reflected that the conviction rate for rape cases in South Africa (SA) was lower than 10%. This prompted the then Minister

of Justice, Jeff Hadebe, to set up a task team to speed up the roll-out of sexual offences courts, and to also look into the expertise of both the SAPS and court personnel who work with these cases (SAPS, 2014:3). The sexual offences courts was not necessarily new courts, but existing courts with a dedicated team of prosecutors and magistrates that dealt exclusively with sexual related cases (SAPS, 2014:3). The idea was to build sufficient capacity at these courts to deal speedily with sexual related cases to yield greater successes and convictions.

This investigation regarding the low conviction rate in rape cases is further illustrated in a recent South African Medical Journal article (2011:4) titled “Sexual Assault Evidence Collection Kit,” (SAECK) which concerns the researchers conducting research in respect of the SAECKs. The aim of the research was to assess the extent of completion of the kits by healthcare workers in six provinces in SA. The researchers inspected 204 kits that had been sent to the SAPS forensic lab in Pretoria for analysis, and they found that none of these kits complied fully with the administrative quality requirements, i.e. the accompanying documentation was not up to the required standard. These are in contrast to the requirements of ILAC, as indicated above. It is therefore imperative that all role-players perform their functions optimally in cases of rape, and maintain the chain of custody at all times. Adherence to these requirements will at least give the state a much stronger chance for a conviction, thereby eliminating loopholes for the defence.

The SAPS forensic labs are equipped to conduct the following examinations in the various centres around South Africa:

- Ballistics unit (e.g. firearms and tool marks);
- Scientific analysis unit (e.g. soil, paint, glass and metals);
- Questionable documents unit (e.g. handwriting, signatures and ink);
- Biology unit (body fluids such as DNA and blood);

- Chemistry unit (drugs, fire and toxicology); and
- Explosives unit (bombs and explosive devices) (SAPS, 2017:4).

These are in line with what Orthmann and Hess (2013:8) and Saferstein (2011:4) have to say about the roles and capabilities of the forensic laboratories. The successes of the SAPS forensic services were highlighted in several high-profile cases such as the Oscar Pretorius murder case. In that case, the ballistics expert, Major Chris Mangena, and the blood pattern expert, Colonel van der Nest, gave expert evidence as regards the analysis that they had conducted on that crime scene. Although they faced very stiff cross-examination from the defence, their evidence was crucial in finding Oscar Pretorius guilty of murder (*S v Pretorius* CC113/2013).

Figure 2.1 below depicts the SAECK used by medical practitioners in SA to collect evidence from rapes victims. The SAECK is referred to in a South African Medical Journal Article (2011:4). These kits are kept at the police stations, and the SAPS normally give the victim a kit and then accompany her/him to the medical practitioner for the medical examination. The SAPS officer then hands the kit as an exhibit for safekeeping, and it is sent to the lab for forensic analysis. According to Lochner and Zinn (2015:14) and Van Der Watt (2015:199) this forms the chain of custody of evidence collected, as discussed in paragraph 2.3.1.



Figure 2.1: Sexual Assault Evidence Collection Kits
(Source: South African Medical Journal Article, 2011:5)

The above discussion confirmed the important role that forensic science plays in the criminal investigation process. Jackson and Jackson (2008:5) and Palmiotto (2013:120) state that a crime investigator must have a basic understanding of criminalistics principles in order to handle the crime scene properly and recognise the importance of evidence found at the scene. Coupled with this, the SAPS training programmes such as the Resolving of Crime (ROC) programme guides the investigator in terms of all aids that can be used, and also all the other forensic experts, such as the fingerprint expert, photographer, blood-spatter expert, and forensic experts. In paragraph 2.7 the researcher will focus on the crime of rape.

2.7 THE CRIME OF RAPE

Gilbert (2007:283), Osterburg and Ward (2010:430) and Palmiotto (2013:141) state that the slightest penetration of the victim's vulva or anal cavity amounts to rape, and further add that sexual crimes include sexual assault, child abuse, pornography, indecent exposure, incest and stalking. Gilbert (2007:283) adds that rape is generally defined as an act of sexual intercourse with a female by force or against her will, and that in the USA the requirement of force and unwillingness are waived in instances where the victim is unconscious or mentally deranged. Palmiotto (2013:141) concurs and adds that the crime is committed by a person or persons without the victim's consent. This is similar to a description of elements in SA. However, in SA the sexual offences such as rape and so forth are all classified as per the Sexual Offences and Related Matters Amendment Act No. 32 of 2007.

Snyman (2014:343) states that the new Sexual Offences and Related Matters Amendment Act, 2007 (32 of 2007), was introduced in 2008, and that its main purpose was to ensure that the various offences would be clearly distinguished from each other, e.g. sexual assault from rape. According to this new Act, rape is defined in Section 3 of the Act, which states that a person is guilty of rape if he or she unlawfully and intentionally commits an act of sexual penetration with a complainant, without his or her consent. Consent means voluntary or uncoerced agreement, and the Act states that penetration can be into the vagina, anus or mouth of the victim. The Act also provides that either a man or a woman may be

the victim or perpetrator of rape (Government Gazette, 2017:6), and that the crime can be committed to a person of the same gender.

The new Act additionally categorises several offences, as mentioned by Osterburg and Ward (2010:430), related to sexual crimes in SA, namely sexual assault, compelled rape, incest, bestiality, and sexual offences against children or mentally disabled persons (Government Gazette, 2017:6). The elements of rape are also described in the SAPS Training Manual on Sexual Offences, Train the Trainer (TTT) (2010:11).

The participants from Samples A, B and C were asked the following question: Based on your experience, what is your understanding of the crime of rape? This was an open-ended question to which the participants could provide their own answers and no choices were provided from which they could choose.

Participants in Sample A responded as follows:

- Eight detective participants stated that it was sleeping or forcing to sleep with a woman and having intercourse with her against her will.
- Four of the detective participants stated that it was sexual penetration of any person, male or female, without consent, and they referred to the Sexual Offence Act 32 of 2007.
- Four detective participants stated that it was the unlawful and intentional penetration of a female sexual organ without her consent.
- Four participants stated that it was penetration of any person, using any object, without their consent.

The participants of Sample B answered as follows:

- Two K9 participants stated that it was an act committed by force or threat, without consent, of penetration

of the vagina or anus with the penis or any other object, and the victim could be male or female.

- Two K9 participants stated it was vaginal, anal or oral penetration with a penis, without the victim's consent.
- One K9 participant stated that the victim was helpless, and that the suspect used force.

The participants of Sample C answered as follows:

- Four of the forensic analyst participants stated that rape is the sexual penetration of another person without their consent, using any body part or object.
- One participant stated that it is when an individual, male or female, is penetrated without their consent, into any of their orifices.
- The last participant stated that it is to pursue a sexual act onto or inside another without consent, i.e. sexual penetration of vagina, anus or mouth.

Looking at the responses from the participants in the three sample groups it was clear that the detectives and K9 handlers gave a more accurate definition of rape and the elements of rape as described in the literature. Most of them named the most common elements of the crime of rape, such as the lack of consent, and penetration. However, only 4 participants in Sample A referred to the new Amended Sexual Offences Act 32 of 2007. None of the participants in Sample B or C referred to this new Act. This is an indication that the participants used for this study, lack knowledge of the new Sexual Offences and Related Matters Amendment Act, 2007 (No. 32 of 2007) and the correct definition of rape. According to the responses from these participants many of them still refer to the old Criminal Law definition of rape.

The elements of rape have to be present in order for the perpetrators to be convicted of this crime, as reiterated by Gilbert (2007:283), Osterburg and Ward (2010:430) and Snyman (2014:344). Gilbert (2007:283) further states that rape is a crime that is socially sensitive in nature, and this makes information-gathering

difficult. The court will rely on both the verbal evidence of the victim and/or witnesses, and the physical evidence, which will corroborate the victim's version of events and will help to prove the suspect's presence at the crime scene. From the response of the detective participants it is clear that they need more training to properly understand the elements of rape, as outlined in the Sexual Offences and Related Matters Amendment Act, 2007 (32 of 2007). The detectives are the main role-players in investigating the rape cases (dockets), therefore it is imperative that they understand this crime fully to apply optimal expertise during investigations.

Furthermore, the Sexual Offences and Related Matters Amendment Act, 2007 (32 of 2007) is very complex and includes more offences than just rape, therefore a proper understanding of it is essential. The crime scene is discussed in paragraph 2.8.

2.8 THE CRIME SCENE

Gilbert (2007:80) states that a crime scene is the location at which a suspected criminal offence occurred, and that all crime scenes to a variable degree contain physical evidence, which may be visible to the naked eye, or minute to the point of being microscopically small. Dutelle (2011:13) defines a crime scene as any place where evidence may be located that will help explain the events, and mentions that a single crime may involve various locations, e.g. a person murdered in one location and the body deposited elsewhere.

Lochner and Zinn (2015:10) refer to a crime scene as the scene of incident, and they believe that the scene of incident is the "engine room" of any investigation. It is the place where clues and evidence are found that will steer the investigation forward. Van Der Watt (2015:162) describes the crime scene as the physical location where an incident has occurred, and it includes visible and implicit scenes that may contain physical, non-physical, direct or indirect information and evidence. Dutelle (2011:13) and Van Der Watt (2015:162) assert that there may be a primary scene and a secondary scene, but that the primary scene will be where most of the action occurred or where most of the physical evidence is located.

Carney (2004:37) argues that in rape cases there are two crime scenes, namely the location of occurrence, and secondly, the victim's body. Osterburg and Ward (2010:432) also assert that the victim's body constitutes a crime scene that possibly contains evidence that has been transferred from the suspect. Carney (2004:37), Dutelle (2011:13), Osterburg and Ward (2010:432) and Van Der Watt (2015:162) believe that a crime might take place in more than one crime scene.

Lochner and Zinn (2015:33) explain that the objectives of crime scene investigation are to identify, recover and document physical evidence, as well as to systematically and carefully collect the facts, clues and physical evidence. They further state that there are five types of crime scenes, namely, primary, secondary, extended, macroscopic and microscopic. The microscopic scene is any small or minute object or piece of physical evidence that is not visible to the naked eye and that is collected at a scene by using special techniques such as pipetting or vacuuming. A macroscopic scene can include the body of a rape victim (Lochner & Zinn, 2015:32).

This point is confirmed by the Locard Principle, which assumes that every contact leaves a trace (Lochner & Zinn, 2015:12). The very nature of rape dictates that the victim's body is the focal point of the early investigation process, since the body will contain evidence of sexual assault, such as bodily or genital injuries (Osterburg & Ward, 2010:432). The researcher understands that with a crime like rape, the Locard Principle will play a very important role with regard to physical evidence. When the suspect commits the rape, some traces of the suspect and victim (e.g. body-fluid, pubic hair, or skin, etc.) will transfer from one body to another, or to the scene of the crime (e.g. the bedding, floor, grass, etc.).

- From the docket analysis carried out at Booyens SAPS, the researcher found that the victim's body and possible crime scene were not classified as crime scenes by the detectives, as agreed by Carney (2004:37) and Osterburg and Ward (2010:432). From the 20 dockets that were perused the researcher made the following discoveries about the issues listed below: The use of forensic experts to gather evidence at the crime scene and the method or aids utilised to collect the evidence: In 3 out of the 20 cases, the FCS members and LCRC experts were called out to the

rape crime scene, meaning that in 17 cases, the crime scenes were not visited by the first responder, detective or the FCS detectives, resulting in the possible omission of physical evidence.

- The evidence that was collected and how it was discovered: In 5 out of 20 cases, the victim visited the medical practitioner and a sample of biological evidence was obtained by means of the rape crime kit. This indicates a lack of evidence in the other cases.

This is in contradiction to what Lochner and Zinn (2015:41) state, namely that the scene of the incident, or crime scene, provides the best opportunity to locate physical evidence. The initial investigation at the scene should, therefore, be regarded as the only chance to recognise, record and collect evidence, thus the investigator should examine the scene as effectively as possible. This also shows a lack of training, skill and knowledge of the police officials (first responders) and detectives on how to handle or investigate rape cases, or although trained, they merely fail to follow correct procedures. During perusal of the 20 dockets, it was noted that in the majority of the cases, the complainant came to the police station to report the rape, and the crime scenes were not physically attended by the police officials. If the scene of crime was indeed visited by the police, it could have resulted in retrieval of possible physical evidence to strengthen the case. The next paragraph deals with the evidence at a rape crime scene.

2.9 EVIDENCE AT A RAPE CRIME SCENE

Gardner (2012:7) defines evidence as anything that tends to prove or disprove a fact in contention, and that in any investigation the evidence presents itself as either testimonial or physical. White (2007:56) describes trace evidence as very small amounts of material such as textile, fibres, glass, paint, etc., which could serve to link an item on which such material is found with an otherwise unconnected source of it elsewhere. White (2007:56) further states that the finding of such trace evidence implies that there has been direct physical contact between the item and the source of the trace evidence, with a subsequent transfer of material between them.

Osterburg and Ward (2010:326) state that evidence could be in three forms, namely, testimonial (given orally by a witness), real (any tangible object or exhibit offered as proof), and demonstrative (could be a chart, drawing, model, illustration, etc.). Osterburg and Ward (2010:326) argue further that evidence could also be classified as either direct or circumstantial. Direct evidence proves or refutes the fact at issue, for example a confession, which is made mainly verbally, whereas circumstantial evidence is indirect proof from which the fact at issue may be inferred, for example forensic evidence (Osterburg & Ward, 2010:326).

Gilbert (2007:52) defines evidence as anything that is properly admissible in a court and that will aid the function of a criminal proceeding in establishing guilt or innocence. Gilbert (2007:52) indicates that evidence may be direct evidence, circumstantial evidence and physical (or real) evidence. Lochner and Zinn (2015:39) state that evidence could be verbal or physical information that is presented in a court of law, and upon which the presiding officer must make his or her finding. Lochner and Zinn (2015:39) identify four types of evidence found at a crime scene, namely physical (real) evidence, documentary evidence, testimonial evidence and demonstrative evidence (refer to definition given by Osterburg and Ward (2010:326), namely a chart, drawing, model, or illustration).

Fisher and Fisher (2012:67) state that detectives do not always possess a full range of specialised skills or experience to process all crime scenes. They therefore have to call in experts to assist and collect evidence, e.g. the detectives from FCS, the LCRC, or forensic experts. Osterburg and Ward (2010:438) postulate that investigators should have sex crime investigation kits with them at all times, as these kits are designed to help with the collection and preservation of evidence. The authors further state that investigators should look for the following evidence at the crime scene:

- Head hair or pubic hair: Must be collected from the victim and the suspect and packed separately; can use a fine comb as well.
- Fingernail scrapings: The victims often scratch or resist the assailant, therefore some vital evidence

might be trapped underneath the victim's nails (e.g. hair, fibres, blood or tissue). If need be, the nails can be clipped and packed appropriately to serve as evidence.

The SAPS Training Manual on Sexual Offences (TTT), (SAPS, 2010:57) provides the following guidelines, which should be adhered to by detectives, K9 handlers, first responders and the forensic analyst's when collecting evidence from the rape crime scene:

- Biological stains should be collected in the most concentrated and complete format possible. A dried stain can be readily scraped from a surface (such as a laminated countertop or a kitchen appliance). The stain should be scraped into a pharmacy fold and sealed.
- Swabs can also be used to collect body-fluid, but the person collecting a swab must be careful if the evidence is dry or still wet. If it is wet, wait for the stain to dry, then package it.

Osterburg and Ward (2010:440) offer the following hints on the collection of blood and semen from the rape crime scene, namely:

- Care must be taken in the collection of blood samples, thus investigators or forensic experts have to ensure that there is no mixing of blood, because it may belong to either the victim or suspect.
- Semen is normally collected by the examining medical practitioner by using "rape kits." The investigator on the scene should collect clothing of the victim and suspect, if possible, and each item should be handled as a separate piece of evidence, packed and labelled separately. In searching for semen samples, it is common to use ultraviolet light because semen fluoresces. This is not a conclusive indication of semen, but it marks the area that should be handled carefully and protected. The use of ultraviolet light is costly and time-consuming if the crime scene is big, thus the use of the BBFD Dog would be invaluable to detect DNA evidence such as blood and semen in these cases.

The above authors have emphasised the importance of both testimonial and physical evidence for proving rape cases. The collection of physical evidence by detectives, as well as the preparation of witnesses for trial are factors that determine the outcome of the case. The physical evidence is very important for corroborating the testimony of witnesses. The newly appointed Police Minister, Mr Fikile Mbalula, has cautioned SAPS members to treat victims of sexual offences (especially women and children) with tact, respect and, most importantly, never turn them away from the police station when a case has to be reported. This statement was made by the minister after a recent spate of serious and violent crimes against women and children, especially rape, murder and femicide (Press Statement by Police Minister: 2017). In paragraph 2.10, the researcher will elaborate on DNA evidence.

2.10 DNA EVIDENCE

According to Butler (2005:17), DNA is regarded as our genetic blueprint because it stores the information necessary for passing down genetic attributes to future generations. Residing in every cell of our body (except for red blood cells, which lack nuclei), DNA provides a “computer program” that determines our physical features and many other attributes. Information encoded within the DNA structure itself is passed on from generation to generation, with one-half of a person’s DNA information inherited from the mother and one-half from the father (Butler, 2005:18). Houck and Siegel (2011:257) describe DNA as a molecule that is found in nearly all cells, except red blood cells. DNA is located in two regions in a cell, namely the nucleus and mitochondria, and both can be used in DNA typing. However, mitochondrial DNA is of a different length and shape, and is inherited only from the mother (Houck & Siegel, 2011:257).

Bell (2008:108) explains that DNA typing is a process whereby the forensic lab analyses blood or other body fluids (that contain DNA), to determine whether they match or could be individualised when compared to the sample of the suspect that is found at the crime scene or on the victim. Butler (2012:10) states that, with the advancement in technology, even the minutest amount of DNA sample can be analysed.

The SAPS Training Manual, "Forensic Biology: Body Fluid Detection" (SAPS, 2010:56) gives a further description and explanation of the breakdown and analysis of DNA, as follows: A forensic DNA profile is a string of alphanumeric characters that represent an individual's identity. This sequence of alphanumeric numbers is nothing more than biometric data code containing information of a purely objective and irrefutable character. The various forensic labs around the world use different methods to analyse DNA samples, and the SAPS lab uses the Short Tandem Repeat Sequence (STRS). When analysing DNA samples, the lab will also have samples of the DNA of other parties or persons that were involved in that scenario, e.g. the police officials, witnesses, the victim(s), and owners of the premises, in order to rule them out as suspects. DNA samples are taken from the suspect or possible suspect (i.e. control sample) and matched to the sample found at the crime scene. The control sample is obtained by means of the non-intimate buccal (mouth swab) test, e.g. the swab is rubbed on the inside mouth area of the donor. DNA will be exactly the same, no matter where in the body it is taken from, as per the SAPS Training Manual, "Forensic Biology: Body Fluid Detection" (SAPS, 2010:56).

Osterburg and Ward (2010:75) state that DNA can be degraded or damaged, but with the introduction of more advanced DNA typing techniques such as Polymerase Chain Reaction (PCR) and STRS methods, even a minimum amount, as little as 1 ng (nanogram) is sufficient for a result, as compared to 100 ng when the Restriction Fragment Length Polymorphism (RFLP) typing method was used. Gardner (2012:32) states that the STRS method is capable of analysing the tiniest amount of DNA, and explains further that touch-DNA was introduced, using the STRS method, which means that simple contact by an individual with a surface has the potential to deposit sufficient quantities of cellular material to identify a complete DNA profile, for example by touching a doorknob, or a bullet casing, or handling a weapon (Gardner, 2012:32).

Butler (2012:7) states that the DNA database is of great value in tracing possible perpetrators of crimes such as rape, since many offenders committing these violent crimes are repeat offenders. Countries like the United Kingdom (UK) and USA have very efficient DNA databases, which assist in tracing rapists, since the

DNA profiles of those suspects are recorded in the database once the perpetrators have been convicted. Houck and Siegel (2011:276) state that in the USA there is a national DNA database that is administered by the Federal Bureau of Investigation (FBI), and some of the larger cities have their own local databases, from which the profiles are then sent to the national database.

SA's new DNA Bill was enacted in January 2015, after much deliberation and pressure by the DNA project initiative (DNA Project, 2016:2). Smith and Zinn (2015:410) describe the new bill as the Criminal Law (Forensic Procedures) Amendment Act 37 of 2013, commonly referred to as the DNA Act. This database will certainly help to track and trace rape suspects in SA, as many of them are also repeat offenders, and since 2015 the SAPS has started to take buccal samples from all arrested and detained persons to store in the DNA database as per the SAPS Buccal Sample Training roll-out (SAPS, 2017:2). Buccal sample is when the police official uses a swab kit (similar to an ear bud) and obtain a sample of saliva from the mouth area of the arrested suspect. The sample is then sent to the SAPS Forensic Laboratory and stored in the data base for future use (SAPS, 2017:3). Smith and Zinn (2015:405) indicate that the use of a forensic DNA database is a powerful tool to provide investigative leads to identify suspects in cases where genetic material (DNA) has been left at the scene of an incident. The real value of a forensic DNA database grows as the size of the database increases.

Like Butler (2012:7), Smith and Zinn (2015:405) also believe that the effectiveness of the forensic DNA database lies in the fact that the majority of crimes are committed by repeat offenders, and previously recorded evidence can therefore be linked quickly to the current suspect. However, the new DNA Act and the DNA database also come with many challenges, according to Smith and Zinn (2015:410-417), since SA is mandated by a powerful Constitution, and the implementation, control and adherence to this new Bill are still in their teething stage in SA. The main issues or challenges, as stated by Smith and Zinn (2015:410-417), are (a) for which offences the samples be obtained from suspects, (b) the period for storage of the DNA profile on the database, (c) access to and control of the database, and (d) confidentiality of the information.

The participants from Samples A, B and C were asked what is their understanding of DNA evidence. This was an open-ended question to which the participants could provide their own answers and no choices were provided from which they could choose.

Participants in Sample A responded as follows:

- Six participants stated that DNA is evidence collected at the crime scene, and analysed at the lab, e.g. blood, hair, semen and other body-fluids.
- Five participants stated that it is biological evidence, e.g. body-fluid such as blood, semen, saliva, etc., which is found on the crime scene and sent to the lab for individualisation of the suspect.
- Five participants stated that DNA is blood, semen, hair and saliva, and that it is used to be compared to a control sample, and analysed to link a suspect, person or victim.
- Two participants stated that DNA can be collected from blood, hair, skin cells and other body substances.
- One participant stated it is the genetic information of a person, that it is unique to that person, and that it can be used to identify persons.
- One participant stated that DNA is collected when a person is raped, and if the victim is pregnant after the rape, DNA can be used to determine paternity.

Participants in Sample B responded as follows:

- Three participants stated that it is evidence gathered at a crime scene, from either the suspect or the victim, and that it can be used in a court of law.
- One participant stated that DNA is a chemical structure and genetic “programme.” It is found in any trace left by the suspect at the crime scene, e.g. hair, blood or semen.

- One participant stated that it is evidence that connects a specific suspect or victim to a crime scene.

Participants in Sample C responded as follows:

- Three participants stated that DNA is a blueprint for everything in your body and that the complex chemical carries genetic information. Each person is unique in respect of blood, semen, body-fluid, hair, etc.
- Two participants stated that it is evidence in the form of body-fluid or cells that can be used to link an individual to a crime or to exclude him/her.
- One participant stated that every contact leaves a trace. DNA is part of a trace, and is left behind during commission of a crime.

The majority of the participants from Sample A gave a fairly reasonable answer to this question, and that was close to how the literature describes DNA, except for one participant who said it was used for a paternity test by the rape victim. These participants also had an idea where DNA can be found, for example, they indicated hair, body-fluid such as blood, semen, saliva, etc., as confirmed by Bell (2008:108), Butler (2005:17) and Houck and Siegel (2011:257). Sample B participants also gave fairly accurate answers that were close to what is indicated in the literature. The K9 handlers attend a compulsory DNA Evidence Recovery course as a prerequisite for their dog-handler course, and this course enables them to identify and safely collect and pack DNA evidence. Sample C participants, who are all trained forensic analysts, gave an excellent explanation of DNA evidence. This sample group often deals with DNA evidence as part of their daily tasks.

The importance of DNA evidence was explained by the various literature sources in this paragraph, and the point made by Osterburg and Ward (2010:75) is quite significant in that only (1) ng of DNA evidence is sufficient to make a finding. The presentation of DNA evidence in court will always be challenged by the defence, as seen in the current Henri van Breda murder trial in the Western Cape High

Court (EWN, October 2017:1). The defence attorney in this case used an external DNA expert (Dr Antonet Olckers) to dispute the state's case, pertaining to the presentation of DNA evidence. Dr Olckers is disputing the testing of 216 DNA samples that were tested by the SAPS forensic analyst, Sharlene Otto. The main contention is that the SAPS forensic lab had failed to adhere to its own standard operating procedures in respect of the quantities of DNA tested, as well as the accreditation of the Cape Town forensic lab (EWN, October 2017:1). The researcher could not get any information on the status of accreditation of the SAPS forensic labs. Paragraph 2.11 elaborates on the value of DNA evidence for rape cases.

2.11 THE VALUE OF DNA EVIDENCE IN RAPE CASES

White (2007:377) states that the first suspect to be convicted largely on the basis of DNA evidence was sentenced at the Crown Court in Leicester on 22 January 1988. Since this case, DNA technology has become commonplace in forensic laboratories around the world and has been instrumental in establishing both guilt and innocence in many court cases.

Butler (2012:5) refers to the case law of *Harris vs United States*, 331 US. 145, 1947, and states that the blood or semen that a perpetrator deposits or collects on the crime scene is a mute witness against him, and that this evidence cannot be forgotten and cannot be wrong, nor perjure itself, but only human failure to find, study and understand it can diminish its value. Besides linking suspects to crimes like rape, DNA analysis could also be used for the following purposes: paternity testing; missing persons (e.g. in cases of babies being swapped or stolen etc.); mass disaster victim identifications (e.g. the recent air crash of Malaysian Flight MH17); identification of soldiers/casualties during war (Butler, 2012:7). Houck and Siegel (2011:276) state that the goal of all forensic analysis is to associate a piece of evidence with as few people or objects as possible and ideally for there to be only one possible source.

Forensics Library (2017:6) states that the production of DNA evidence and databases has allowed for faster apprehension of suspects by comparing new crime scene samples to those already stored in the database, providing links

between criminals and other crimes. It has also been widely used in old cases, in some instances proving the guilt of an individual some decades after he/she had committed the crime. Conversely, wrongly imprisoned individuals have been exonerated through the advent of new DNA analysis techniques and databases (Forensics Library, 2017:6).

Osterburg and Ward (2010:437) emphasise the importance of DNA evidence in a rape case, in that it can establish a link between the victim, offender and crime scene, especially in instances where the suspect claims he was not present at that scene. Osterburg and Ward (2010:69) also state that besides semen, other types of biological evidence are suitable for DNA analysis in cases of rape, e.g. blood (if white cells are present), hair (if the root is present), saliva, skin (if nucleated cells are present), bone, teeth, urine or faeces. DNA analysis is regarded by some in law enforcement as the greatest breakthrough since the advent of fingerprinting and the computer, and all the courts in the fifty states in the USA allow DNA test results to be admitted as evidence (Osterburg & Ward, 2010:69).

Osterburg and Ward (2010:69) and White (2007:382) warn that DNA profiling could also be used maliciously to frame an innocent person, therefore great care must be taken to gather evidence independent of DNA results to corroborate that the suspect did in fact commit the crime. White (2007:382) highlights the various methods and tests that are used to collect biological evidence (such as blood and semen) from a crime scene, and the one test is called the "search test," using filter paper, or fluorescent lights and chemicals to help detect the evidence. These methods are costly and time-consuming, and White (2007:382) states that these tests are not entirely specific or accurate because other substances that are not body-fluid could undergo the same reaction as haemoglobin (blood), saliva or seminal enzymes (semen).

From the literature mentioned above it is clear that DNA evidence does play an extremely vital role in rape investigations. Butler (2012:5) makes an important point when he states that DNA evidence is regarded as a mute witness that cannot forget or go wrong. The DNA evidence is thus regarded as corroborative evidence that will confirm the version or oral testimony of the witnesses, as indicated by Osterburg and Ward (2010:69), to convince the court that the version

of the witness is the correct one, thereby ensuring a guilty finding. White (2007:382) also mentions some of the difficulties in detecting body fluid evidence at a crime scene, such as the cost factor and amount of time it can take to find this valuable evidence. Next, the concepts of identification and individualisation will be discussed.

2.12 IDENTIFICATION AND INDIVIDUALISATION

Houck and Siegel (2011:57) define identification as the examination of the chemical and physical properties of an object and categorising the object as a member of a group, which is then called a “class.” Budhram and Van Graan (2015:47) describe identification as the process of identifying, collecting and classifying evidentiary material from a person or object (which is usually visible but in certain cases not visible to the naked eye) into a specific category that will allow for proving or disproving a fact in contention.

According to Bell (2008:210), individualisation is the process of linking physical evidence to a common source, and it starts with identification. Bell (2008:210) further states that many people confuse individualisation with the term “identification,” but in the forensic context, they are not the same.

Bell (2008:210) illustrates the difference between identification and individualisation by giving the following practical example: A statement such as “the fingerprint was identified as belonging to Joe Soap” is not correct. It should rather be “the fingerprint has been individualised and linked to Joe Soap as the one and only possible source.” If a suspect leaves a print on a firearm, the fingerprint expert lifts the print, sends it to the criminal record centre for comparison, and this print matches that of the suspect, then the two prints, i.e. the one on the firearm and the one on the database at criminal record centre, have a common source. The print on the firearm is thus individualised. Bell (2008:210) says that individualisation can also take place with other types of evidence such as blood and semen (via DNA typing), impression evidence (such as ballistics, e.g. marks made by a gun barrel on the cartridge case).

Budhram and Van Graan (2015:65) also believe that identification and individualisation are not the same and further state that evidence must first be

identified before the investigation can continue. Identification is merely concerned with the identification of something or somebody belonging to a specific category, and does not allow comparisons to be done. Individualisation, on the other hand, involves comparison, usually of the disputed object found at the scene of crime, with an object of known origin obtained from the suspected person.

Identification and individualisation of DNA evidence are therefore crucial for this research, as this type of evidence, when discovered at the rape crime scenes, could help to individualise the potential suspect, thus linking him/her to the crime. For this to take place, it is imperative that evidence be detected by detectives at the rape scenes, or from the rape victims. In paragraph 2.12.1 the researcher will elaborate on DNA as an individualisation technique.

2.12.1 DNA as an individualisation technique

Individualisation as a technique could contribute to proving of rape cases by linking the evidence to the suspect, as highlighted by Bell (2008:210), Budhram and Van Graan (2015:65) and Houck and Siegel (2011:57). For this to happen, the detectives have to detect, collect, pack and send the body-fluid evidence from the rape scenes to the SAPS forensic labs. The submission of DNA evidence will also indicate whether a serial rapist is operating in the area. Although the official DNA database in SA is still quite new at this stage, the DNA evidence collected will help to identify suspected offenders, and this evidence will strengthen the case against them.

The SAPS Training Manual: “Forensic Biology: Body Fluid Detection” (SAPS, 2010:33) outlines in detail the application of the Locard Principle when dealing with physical evidence at a crime scene. According to Locard’s Principle, when two or more objects come into contact with one another, the one object will always give something of itself to the other object(s) and receive something from the other object(s). It is impossible for a criminal to act, especially considering the intensity of a crime, without leaving traces of his/her presence. Detectives and crime investigators are urged to apply the Locard Principle to identify objects and surfaces with which the person has made contact.

Each contact will transfer a specific type of physical evidence, which requires dedicated techniques to collect and preserve. Example of evidence can be the semen of the perpetrator in the vaginal area of the victim, or on the victim's underwear or clothing, on carpets or flooring, or also in the veld or grassy areas. The victim will be sent to a medical practitioner for medical examination. The doctor obtains samples from the victim, and these are sent to the forensic lab. If the suspect is known, he or she will have to provide a DNA sample (by means of the buccal sample from the inner cheek), and this sample will be compared to the one at the lab. A positive match means the DNA evidence is individualised to the suspect, as both are from a common source, as was explained by Bell (2008:10). Another example is when the victim of a rape scratches the suspect with a fingernail, and the suspect's skin will remain behind underneath the finger nails of the victim.

When carrying out the docket analysis at the Booysens SAPS, the researcher looked at what evidence had been collected and how it was discovered. In 5 out of 20 cases, the victim visited the medical practitioner and a sample of biological evidence was obtained by means of the rape crime kit. This indicates that in the remaining 15 cases where dockets were opened no evidence was obtained, hence if no physical evidence were sent for forensic analysis, this would weaken the case if a suspect were arrested. Evident from all the literature referenced in this study it is accepted that DNA evidence is extremely useful for individualising a suspect, and it also strengthens the case in instances of rape. The next paragraph 2.12.2 deals with the use of DNA evidence in proving rape.

2.12.2 The use of DNA evidence in proving rape

Schwikkard and Van Der Merwe (2007:21) explain the importance of proving the elements of a crime in order to get a conviction for any offence. The burden of proof, these authors state, lies with the state, and in our courts, the state is represented by the state prosecutor. The court has to be satisfied beyond reasonable doubt before finding a person guilty of rape. The evidence presented will be by means of oral testimony (victim and witnesses), and physical evidence that will be presented by forensic experts and the detective, as was indicated by

Gilbert (2007:52), Lochner and Zinn (2015:39) and Osterburg and Ward (2010:326).

Snyman (2014:346) explains the main elements of rape, which takes place without consent and is the forcible act by the perpetrator of sexual penetration into the victim's sexual organ, mouth or anus, which must be unlawful and intentional. However, Snyman's explanation is in respect of the older common-law offence of rape, and not the new Sexual Offences Act. The physical evidence can be proved by means of individualisation of the DNA samples, such as semen (i.e. from the suspect, and the sample obtained from the victim). According to White (2007:414-422), once there is conclusive proof that the DNA sample does match the suspect (i.e. individualisation), the court has to prove the intention of the perpetrator, and that the act was committed by force onto the victim without his or her consent. This evidence is usually by means of oral evidence (i.e. victim will give an account of what transpired, and may have witnesses to corroborate this oral testimony). White (2007:414) further states all the different role-players who are involved in the court proceedings, including the witnesses, the suspect, a forensic expert for the state, and another for the defence.

In the case of *State vs J Rikhotso* (2012), where the accused was charged on 58 counts (which included 11 counts of kidnapping, and 19 counts of rape in terms of section 3 of the Sexual Offences and Related Matters Amendment Act, 2007 (32 of 2007) and several charges under this new Sexual Offences Act), the judge in this case indicated that a rape conviction is inevitable in the event of the state establishing the elements of the offence, and that both anal and vaginal rapes are prohibited. There is no difference between the two. However, the judge found the other sections of the new Act contentious and acquitted the accused on most of the lesser charges. After this case, the new Sexual Offences Act had to be re-visited and amended accordingly, as per due processes in parliament (Sexual Offences and Related Matters Amendment Act, 2007 (32 of 2007). Amendment of such laws entails inputs and comments from all sectors of society (including Non-governmental Organisations (NGOs), lawmakers, the public and whoever has any interest in these matters).

2.13 SUMMARY

The investigation of rape cases is by far one of the most difficult, time-consuming and strenuous tasks for any investigator. This task requires a high degree of compassion, patience and dedication from the detectives involved. This is because of the state of mind of the victims they deal with, e.g. minor children, distraught victims, elderly victims, etc. According to recent studies by the Institute of Security Studies (ISS), a leading senior researcher, Gareth Newham, has stated that crimes against women and children, such as sexual assault and rape, have increased drastically over the last few years, with conviction of offenders declining (ISS Report, 2017:4). Newham asserts that this is attributed mainly to poor police investigation, police bungling of cases, police apathy, and the under-utilisation of resources.

This chapter covered the first research question in respect of what criminal investigation entails. The chapter focused on criminal investigation and its objectives, forensic science, forensic science in the SAPS, rape, crime-scene handling, DNA evidence, and identification and individualisation. All these aspects form part of the objectives of crime investigation, and are important phases that will ensure a successful investigation of rape cases, if applied effectively by detectives. It is clear that the SAPS has sufficient resources and expertise to investigate these cases, e.g. the forensic experts, modern forensic laboratories, and dedicated FCS units. The (Sexual Offences and Related Matters) Amendment Act, 2007 (32 of 2007) was introduced in 2008 as a measure to curb and address sex-related offences. The eradication or reduction of sexual offences in society depends on the detectives, who must use all possible avenues, including scientific methods, to collect evidence and must optimally use investigative aids and resources available. Chapter 3 will focus on the use of the BBFD Dog as an aid in the investigation of rape cases.

CHAPTER 3

THE USE OF A BIOLOGICAL BODY-FLUID DETECTION DOG DURING THE GATHERING OF DNA EVIDENCE IN RAPE INVESTIGATIONS

3.1 INTRODUCTION

“Police Dog used to sniff out murder and rape suspect in Mpumalanga”

(Laevelder Newspaper, 2014:3).

In 2013, the SAPS K9 BBFD Dog, Marky, successfully detected blood and semen evidence at several crime scenes involving a serial rapist in the Hazeyview, Mpumalanga area, which resulted in hefty sentencing of the suspect. Over 80% of the reported rape cases were withdrawn at Booyens SAPS during the period April 2013 to April 2014, i.e. 84 out of a total of 106 cases for that period (SAPS, 2014:2). The researcher cannot conclusively say what the cause for such a high withdrawal rate is, but will argue that it was due mainly to a lack of evidence at the crime scene. This evidence is required in order to link the suspect to the crime scene.

This chapter will explore and provide a descriptive analysis of how a BBFD Dog is used during the gathering of DNA evidence in rape investigations, in order to address the second research question. This section will examine how other police agencies train and utilise dogs, and determine what value, if any, these dogs could add as an investigative tool or technique, especially in rape cases. This chapter will also highlight the features and adaptability that dogs possess to enable them to perform functions such as sniffer work, obedience and discipline. The literature will show that many policing agencies worldwide make use of dogs for various policing functions; however, the SAPS is unique in having the BBFD Dog at its disposal. The BBFD dog is only available in SA and used by the SAPS for detection of body-fluid evidence. The researcher will strive to show how the BBFD Dog can detect minimum amounts of body-fluid evidence at a rape crime scene, and hopefully this may be adopted as a good practice by other police agencies in their fight against crime, and also be widely adopted within the SAPS.

3.2 USE OF POLICE DOGS

Dogs were domesticated some 15 000 years ago, after evolving from Asian wolves, and man created newer breeds to suit specific purposes as the years went by (Fogle, 2006b:8). Fogle (2006a:90) strongly believes in the sentiment, which is also shared by Coile (2005:10) and Morgan (2005:12), that dogs have abilities more sophisticated than our own, thus we have been using them to guard and protect us, drive livestock, follow scents during hunting, in search-and-rescue operations, and for police work.

Newlon (1974:19) explains that the value of a police dog lies in its ability to search, attack and capture, detect drugs and explosives, and serve as a deterrent to crime. The author asserts that police dogs have demonstrated almost unbelievable talent in tracking and searching, and that they have proved to be immensely valuable, since they are effective and save hours of time. Newlon (1974:60) further states that the dog is a scenting animal, and its olfactory organs (sense of smell) furnish it with most of its perceptions, and its actions are primarily governed by this faculty. Fogle (2006b:311) states that dogs share a range of needs, feelings and emotions with us, but they are not people in disguise. To a dog, the handler or owner is seen as the pack leader.

Stejskal (2013:4) states that a vital aspect of a forensic investigation might be to detect specific people or substances of interest, ranging from illegal drugs, missing people or secret graves. Sophisticated detection equipment does exist for detection. However, this technology may be expensive, is not portable, or might even prove useless when vast areas are searched. Fortunately, for detectives, there is an ideal tool available, namely dogs, also known as K9s or “sniffer dogs” by law enforcement professionals. These K9s have played an important role in legal investigations for decades, with their keen sense of smell being harnessed to aid investigations.

Lochner and Zinn (2015:83) state that in SA the idea of using dogs as an aid in tracking suspects originated in 1907, when the daughter of Cornelius Kuyper witnessed a murder. Mr Kuyper convinced the then Commissioner of the Transvaal Police, Colonel Truter, to use dogs in the prevention, combating and

investigation of crime. In 1911, three Doberman Pinchers, named Maxim, Bosco and Pitty, were imported from the Netherlands. Kuyper successfully proved in 1911 that dogs could be used for the prevention, combating and investigation of crime by training these three dogs at the South African Police Dog School in Irene, South Africa (Lochner & Zinn, 2015:83). Lochner and Zinn (2015:83) and Newlon (1974:19) state that dogs have a highly sensitive olfactory system, which discriminates between different human scents and is very effective in sniffing out objects.

During a literature study about police agencies around the world, it was discovered that police, army or security departments from nearly all these countries utilise dogs for some purpose (Dogs for Law Enforcement: Police Dogs, 2013:10). The SAPS hosted the Working Dog Veterinary Conference at Sun City, South Africa, in October 2011 (SAPS, 2011:1). The conference was attended by delegates from the policing, military, security and private sectors, from approximately 180 countries worldwide. This indicates the important role that dogs adds to policing.

The SAPS has an academy for K9 training, which is the Roodeplaat K9 Academy near Pretoria. All K9 training for the SAPS takes place at this academy. The SAPS trains and utilises dogs for the following disciplines (SAPS K9 Academy Prospectus, 2012:6):

- Explosives detection: For detection of explosives, explosive devices, firearms and ammunition.
- Narcotics detection: Detection of narcotics and narcotic substances (e.g. dagga, mandrax, tik, cocaine, heroin, etc.).
- Patrol dogs: Used mainly for tracing and apprehending suspects. These are the only vicious dogs in the SAPS, since they assist in the arrest of fleeing suspects etc.
- Fire detection: Detection of fire accelerants or causes of possible fires in cases of arson (e.g. methylated spirits, petrol, paraffin, thinners, etc.).

- Currency detection: Detection of bank notes (money), but only South African currency.
- Sheep dogs: For sheep gathering and counting in farming or rural areas, when stock theft has been committed.
- Protected-species detection: Detection of abalone, and any other endangered species such as rhino horn, tusks, fauna for example the Protea flower.
- Carcass and hide detection: Detection of animal or livestock carcasses or meat, following theft of livestock.
- Tracker dogs: Used for tracing of suspects who leave behind a track or print, these dogs are capable of following a track for almost 100 km.
- Search-and-rescue: Used for any search-and-rescue operation, e.g. after natural disasters such as floods, mine-rescue; dogs can trace missing persons or help to recover corpses.
- Biological body-fluid detection: Detection of body fluid (e.g. blood and semen) at any serious crime scene; the dog can conduct a search in any area or terrain.

The Roodeplaat K9 Academy houses almost 600 dogs at a time and the staff of the academy have to ensure that they continuously practice with and train the dogs for them to perform optimally and also stay fit, healthy and agile (SAPS K9 Academy Prospectus, 2012:5). Five BBFD Dog handlers (participants) from 4 provinces were interviewed for this research, and all indicated during the interviews that they were active handlers in this field. All these handlers were also trained at the SAPS K9 Academy Roodeplaat. The 5 participants confirmed that currently, SA is the only country in the world that has active BBFD Dogs for detection of body-fluids.

The police dogs play a huge role in crime prevention, crime combating, and investigation of crime in SA, as confirmed by Fogle (2006b:311), Lochner and Zinn (2015:83), Newlon (1974:60) and the SAPS K9 Academy Prospectus (SAPS, 2012:6). This prospectus of the SAPS K9 Academy shows the respective types of

disciplines that dogs can be trained in. During the literature search for this study, no information or data could be found to confirm that the BBFD Dog was available or used anywhere in the world, other than in SA. Lochner and Zinn (2015:84), similarly to what the SAPS K9 Academy Prospectus (2012:6) states, give an overview of the various purposes that the SAPS police dogs could be used for. These include patrol dogs, tracker dogs, search-and-rescue dogs, explosives detection dogs, narcotics detection dogs, fire detection dogs, cadaver dogs and currency detection dogs.

This study focuses on the BBFD Dog and how this dog could be of value to detectives in rape investigations. The literature has so far shown that the SAPS currently has a capacity in various K9 disciplines. The next paragraph will focus on the selection of police dogs.

3.3 SELECTION OF POLICE DOGS

Mahir (1970:30) states that there are three requirements on which the selection of dogs for police work must be based, namely temperament, physical construction and potential working abilities. Dogs have the same five senses as man, but Mahir (1970:34) says that police dog trainers regard the following four senses as the most essential, namely smell, hearing, sight and touch.

The SAPS Training Manual on Dog Training (SAPS, 2007:35) also highlights these aspects of smell, hearing, sight and touch, as indicated by Mahir (1970:34). The manual further states that obedience, discipline and scent work are the most vital traits of a potential police dog. The following writers, Case (2005:34), Coile (2005:10), Fogle (2006a:55) and Morgan (2005:12) are all veterinary experts who are involved mainly in private dog training and not directly involved in selection or training of police dogs. Their inputs and theories are, however, similar to those used in SAPS dog training and the international working dog training standards.

Dogs for Law Enforcement (2013:3) states that in the 1970s the use of dogs in law enforcement took a foothold in the USA. Dogs are now considered a part of the police force, and in many departments, they have their own badges. From the hundreds of dog breeds, some are widely known for their presence in law enforcement. The most common dog for regular patrol work is the German

shepherd, since they are more easily available than other dog breeds and also one of the oldest breeds around. Other breeds include the Labrador retriever, Belgian Malinois, and the Dutch Shepherd. Certain breeds have been used for specific purposes, such as detecting illegal drugs or explosives, and tracking fugitives or missing persons.

The temperament and aggressiveness of the specific dog breed will determine for what purpose that dog could be used, e.g. aggressive dogs will be used for patrol work, whereas the passive dogs will be used for sniffer work, since they work in areas where people are present (Dogs for Law Enforcement, 2013:3). The Irish Veterinary Journal (2006:1) states that the ability of dogs to locate their target scents while ignoring the many non-target scents encountered in their search environments (e.g. airports) is claimed to be better than that of instruments.

The SAPS has a dedicated veterinary service that oversees the care, treatment and welfare of all police animals, and they adhere strictly to all requirements pertaining to animal welfare and care as prescribed by the Society for Prevention of Cruelty to Animals (SPCA), (SAPS, 2016:2). Some of these include:

- X-rays of hips, to detect a common problem of hip dysplasia (which is primarily caused by in-breeding). In-breeding refers to the mating of two dogs that are closely related to each other, such as mating of siblings or cousins (Pets4homes, 2018:2).
- Bone structure for suitability.
- Nutrition, including the type of food used to feed the dogs, as well as the quantities.
- Shelter for dogs, including the kennelling, cleanliness of kennels, play and work areas.
- Equipment used for training, e.g. ball for rewards, types of leashes, choke chains, puppy line, etc.

The SAPS Veterinary Services is responsible for checking all dogs for suitability in terms of medical requirements. The K9 trainers at Roodeplaat Academy apply strict criteria to check the dogs for their suitability to be trained as a potential police dog. The strict criteria include inter alia, that dogs are thorough breeds, in

excellent health, not older than eighteen months (this applies to donation and purchase dogs), meet certain SAPS training requirements (like temperament, obedience, very high drive and potential of the dog). Dogs are obtained by means of donations, purchase and in-house breeding (SAPS Animals of the Service, 2016:2). There is a huge demand for dogs internationally, hence the price of purchased dogs (international market) is approximately R75 000,00 per dog, because of this huge need.

In June 2016, 32 Malinois (Belgian shepherd) dogs were purchased from Die Bergakkers Kennels in the Netherlands for approximately 2,2 million rand (SAPS Animals of the Service, 2016:3).

The literature in this paragraph, together with the SAPS veterinary requirements and the researcher's knowledge of police dogs, indicates that the requirements or criteria for selecting police dogs are quite strict. There are also measures in place in the SAPS for selecting the correct dogs to be trained for police work in the various dog disciplines. The next paragraph will focus on the important senses that dogs possess.

3.3.1 The dogs sense of smell, hearing and vision

Like Newlon (1974:60), Mahir (1970:36) also believes that a dog's keenness of smell far surpasses that of a human being, and its nose is ideally constructed for the detection of the faintest odours. Case (2005:55) believes that the dog's ability to detect certain odours is 100 times more effective than that of a human, and this is illustrated by the worldwide distribution of trained dogs who detect narcotics or explosives. Fogle (2006a:80) concurs with Case (2005:55) and Newlon (1974:60) when he argues that the dog's sense of smell is one of its most acute senses, and that it is capable of detecting odours that even the most advanced technology cannot register.

Maguire (2017:2) states that a dog interprets the world predominantly by smell, whereas a human does so by sight, and that a dog's sense of smell is about 100 to 10 000 000 times more sensitive than that of a human. A dog has between 125 million to 300 million scent glands, and a human has only about 5 million. The dog's nose is always wet (with mucus) because this helps it to smell by capturing

scent particles (Maguire, 2017:2). Figure 3.1 below gives an indication of what a dog's nose looks like, i.e. that it is wet or moist, as indicated by (Maguire, 2017:2).



Figure 3.1: A dog's nose (always moist or wet)

(Source: Maguire, 2017:3)

Captain Bokka Nel (SAPS, 2007:4), who conducted research in respect of the BBFD Dog stated that imprinting of the dogs (a process whereby the dog is trained to smell a certain substance, e.g. explosives or narcotics) takes place by means of plastic pipes (where the actual training sample is mixed with other substances). The dogs are then trained to detect the substance by using their sense of smell.

A dog's sense of hearing is so acute that it can hear sounds that are pitched far beyond the limits of the human ear and into the ultrasonic range (Mahir, 1970:36). Dogs assist their handlers to detect where a sound is coming from in different kinds of policing operations or activities; for example, they can help the handler to detect where gunshots are coming from, or voices in rescue operations, or fleeing suspects on foot, and so forth. When people let off fireworks during festive occasions, this always affects dogs by causing them a high level of stress, thus showing how sensitive and effective their sense of hearing is. It is said that a dog's hearing is seven times more powerful than that of humans, and loud noises therefore terrify them. Police dogs are generally trained not to fear sounds like gunshots, because a patrol dog has to attack and apprehend fleeing suspects, or suspects who are a danger to the SAPS K9 handler (SAPS Training Manual for Patrol Dog Training, 2008:4).

The vision of a dog when he is looking at stationary people or objects is not good, and may be described as poor when compared to that of man. It is believed that dogs see things in outline rather than in detail. The dog, however, has a highly

developed ability to notice the slightest movement, even at a great distance, and this, together with its acute sense of hearing and general alertness, makes it an invaluable asset as an aid for the police (Mahir, 1970:37). Maguire (2017:4) states that a dog sees most things in black and white or grey, and the colour red or orange appears yellow to dogs.

From the above explanations of Maguire (2017:4), Mahir (1970:36) and SAPS Training Manual for Patrol Dog Training (2008:4), it is clear that the sense of smell or scent is the most vital attribute of a police dog or any working dog per se. The sense of smell is what will be required of the dog to sniff potential evidence at a crime scene. The SAPS Training Manual on Dog Training (SAPS, 2007:35), together with Case (2005:55), Fogle (2006b:80) and Newlon (1974:60), according to their explanations, believe that a dog can be trained to sniff any substance or object, provided that it has been trained accordingly, e.g. the BBFD Dog, which is trained to sniff human body-fluids like blood and semen. However, Newlon (1974:60) warns that training a dog is a painstaking procedure and that it could take a long time for the dog to master these skills. The SAPS Training Manual on Dog Training (SAPS, 2007:38) states that a trainee undergoing K9 training spends almost 5 months away from their families in order to complete their K9 training courses at the SAPS Roodeplaat K9 Academy. The next paragraph deals with the theory of scent regarding police dogs.

3.4 THE THEORY OF SCENT IN POLICE DOGS

Mahir (1970:85) states that when a police dog is being trained, the focus is firstly on obedience, then tracking and searching, and then scent work. The handler should have a reasonably good knowledge of the theory of scent and understand the application of this theoretical knowledge to the kind of practical situation he/she will encounter in the course of their daily duties as a police officer. Fogle (2006a:55) confirms the scenting ability of dogs by comparing the olfactory neurons in their noses to those of humans, and states that dogs have between 220 million and 2 billion olfactory neurons compared to humans, who have about 5 million. The strong scenting ability is also confirmed by Maguire (2017:2), who states that controlled tests have proved that trained dogs can even detect minimum concentrations of substances.

Fogle (2006a:56) states that dogs have an additional scent organ called the “vomeronasal organ,” which is found in the roof of the mouth and aids them in scenting. Cramer (1968:19), Mahir (1970:30) and Newlon (1974:60) all emphasise that the faster a dog can be brought to a crime scene to follow a scent before it begins to fade away, the more likely an arrest will be made. Scent can evaporate quickly and is affected by the weather. The best weather conditions for tracking are mild and dull weather, and conditions that affect scent badly are hot sunshine, strong winds and heavy rainfall. The scent in this instance refers to evidence at the crime scene. The SAPS Training Manual Resolving of Crime (2009:145) states that evidence on the crime scene should be collected soonest in order to avoid contamination, and this is where the BBFD Dog would be very effective, to detect evidence quickly. From some of the actual cases that will be mentioned later in this study, pertaining to the successes of the BBFD Dog, it will be shown that the dog still detected body-fluid at some of the rape crime scenes a few days after commission of the crime, which still achieved convictions in court.

Police dogs are concerned with both ground and airborne (or windborne) scent. The scent followed by dogs in tracking is ground scent and is caused by any contact with the ground, e.g. crushing of grass or vegetation, or by a deposit of particles of materials from the footwear of the suspect, and these will all add up to form a trail of ground scent (Mahir,1970:86). According to Stejskal (2013:5), dogs are trained to be either trailing dogs or air-scenting dogs. Trailing dogs follow a scent on the ground, whereas air-scenting dogs must be able to pick an odour out of a breeze and follow it back to its source.

The literature again highlights the importance of the sense of smell that dogs possess. This strong ability of the dog’s sense of scent, e.g. the BBFD dog, could be of immense value to detectives during crime investigation, especially in rape and murder cases where body-fluid evidence is hard to detect or is often cleaned up by the perpetrators. The BBFD Dog is trained by the SAPS to detect very minimal amounts body-fluid evidence on any type of surface. The next paragraph will elaborate on the BBFD Dogs in the SAPS.

3.5 BIOLOGICAL BODY-FLUID DETECTION DOGS IN THE SAPS

In 2003, the Research and Development section of the SAPS K9 Academy proposed the idea of training a dog to detect human body-fluid at crime scenes (SAPS Research and Development Document, 2007:3). This idea was regarded as a rather impossible mission by many in the K9 and forensic fields, as they could not imagine a dog being trained to detect blood and semen. A request emanated from the SAPS Division Visible Policing, K9 and Mounted Services Section, to train a dog to detect human body-fluids at serious and violent crime scenes, to assist the detectives in tracing and detecting body-fluid evidence (e.g. blood, semen or saliva). The main reason for this request was due to the escalation in the rate of serious and violent crimes such as rape and murder (SAPS Crime Statistics, 2003:4). The idea was to apprehend and convict criminals who committed these crimes, with the possibility of the dogs helping detectives in this regard. Dogs were already being used by the SAPS as an aid in solving other problematic crimes such as the drugs and narcotics scenes (Narcotic Detection Dog).

Research of the possibilities of training a BBFD Dog was conducted and headed by Captain Bokka Nel at the SAPS K9 Academy at Atteridgeville, Pretoria. He made use of electronic literature, book studies and interviews, and the result was that no specific information was available on this concept (SAPS Research and Development Document, 2007:3). This confirmed that no other countries were making use of the BBFD Dog or similar kind of dog. Captain Bokka Nel and his team were responsible for designing new training for the K9 environment, and also researching changes to existing K9 dog disciplines, e.g. if new drugs were introduced in the market, the team would address it by revising the Narcotics K9 training programme.

The K9 research team for this pilot project also included members from the SAPS Forensic Services, and from Visible Policing. The K9 research team deliberated on what body-fluid substances to train the BBFD Dog to detect. The team came up with the idea to imprint the dogs with blood, semen and urine. Later it was decided by the research team that only blood and semen should be imprinted. The forensic services members stated that it would be difficult to collect urine as evidence and

urine may not contain sufficient DNA. Hence, the K9 research team worked together to develop the BBFD Dog (SAPS Research and Development Document, 2007:3).

Dogs identified for training in this discipline, i.e. as a BBFD Dog, needed attributes such as being highly playful, having exceptional focus, being small in build and having a high degree of flexibility, since they must be able to search and turn inside a motor vehicle (SAPS Research and Development Document, 2007:3). The dog had to be imprinted to detect only human blood and semen. The Border Collie-breed dogs was chosen to be trained as BBFD Dogs, because they met all the attributes mentioned above. It was decided to train the dogs to search in the following areas and venues because crimes of murder or rape could be committed anywhere, so the dogs have to be trained to work in all of these environments:

- Open areas (fields, bush and any outdoor-type scenario).
- Buildings (inside any type of house, storeroom, office, etc.).
- Motor vehicles (cars, minibuses, buses, etc.).
- Containers, clothing and bedding/furniture (SAPS Research and Development Document, 2007:5).

The study participants were asked the following question: What is your understanding of the BBFD Dog? This was a question that was relevant to all the participants. It was an open-ended question to which the participants could provide their own answers and no choices were provided from which they could choose.

Sample A participants responded as follows:

- Fifteen of these participants stated that it is a police dog that has been trained to detect body-fluid such as blood or semen at a crime scene.

- Three participants stated that the dog could sniff blood and semen at a crime scene that were not visible to the naked eye.
- Two participants had not heard about the dog.

Sample B participants responded as follows:

- Three of these participants indicated that it is a dog specifically trained to detect fluid from humans (blood and semen) at a crime scene, where the quantities are so small that they are not visible to the human eye.
- Two participants indicated that the dog would act without disturbing the scene. A tiny drop of human blood or semen could be detected by the dog, day or night, in any area, e.g. buildings, vehicles and open areas.

Sample C participants responded as follows:

- Four of the participants stated that these are trained dogs used to scent body-fluids such as semen or blood at a crime scene.
- One participant indicated that the dog is used to trace possible body-fluid such as semen or blood, and that it would give a clue to indicate where the fluid is.
- One participant mentioned that the dog would go into areas where it is not possible to use reagents, e.g. large areas or in dark conditions.

The majority of the detective participants were familiar with the BBFD Dog and only 2 participants indicated that they had not heard about it. Sample B participants also gave a good explanation of the BBFD Dog. The participants of Sample C responded well to the question and knew about this dog. The overall response from all the participants was very good and is an indication that they are aware of the BBFD Dog, except for the 2 participants from Sample A. It is not known why these 2 participants are not aware of the BBFD.

According to the SAPS Visible Policing K9 and Mounted Service section, there are 102 SAPS K9 units, which are based all over the country, and these K9 units service a number of local police stations that are close to them (SAPS, 2015:2). The closest K9 unit and the one that services the Booyens SAPS is Langlaagte K9 Unit in Johannesburg, which incidentally is one of the largest K9 units in the country. This unit services twenty one police stations in the Johannesburg area (SAPS, 2015:3), hence the detectives from Booyens SAPS are the clients of the K9 Unit and rely on the dogs for various policing duties, including the BBFD Dog from this unit. The next section will focus on the training samples that the K9 research team used for this project.

3.5.1 Training and piloting of the biological body-fluid dog in the SAPS

Maguire (2017:8) states that dog training consists of cues and activities such as sit, roll over, fetch, and so on. When teaching these tricks, positive reinforcement is the way to go. “Fetch my shoes,” “roll the ball with your nose,” and “catch the biscuit from your nose” are possible commands and the dog gets a treat, belly rub, verbal praise or pat on the head, with the words “good dog.” These activities challenge the mind and provide great bonding time. Maguire (2017:9) further states that dogs are also instinctively pack-driven, i.e. led by a leader in the pack, and similarly, the human is now the leader, therefore it is important to understand dog behaviour before one trains a dog.

The researcher investigated training of police dogs in the USA by reading reports by the SAPS K9 trainers on their visit to the USA, and it was noted that the USA training methods are similar to those of the SAPS (SAPS, 2016:3). Some differences in the training are evident in the rewarding of the dogs, e.g. in the USA they often use the food reward method, and the clicker (small plastic device that makes a clicking sound) method, whereas the SAPS uses the ball reward. The imprinting, socialising of dogs, obedience and temperament are common to agencies both locally and in the USA.

During the pilot training phase of the BBFD Dogs at the SAPS K9 Academy Atteridgeville, Pretoria, during 2004, the K9 handlers and dogs bonded together for about two weeks. The pilot training was to train the first 4 BBFD for the SAPS

K9 environment, in order to see if the BBFD Dog will be a success for operational use. The operant conditioning process was used, whereby the dog was rewarded (by means of a ball) for good work, which is known as the “ball reward” method. Passive indication was chosen to prevent the dogs from disturbing, touching or destroying the substance, so that it can be collected and analysed to link a suspect to a crime scene with the aid of DNA comparison. This is to prevent the dog from licking or scratching the exhibit/evidence and destroying it, especially if there is only one drop of blood or semen at the scene (SAPS Training Manual on Dog Training, 2007:22). The dog provides a positive indication by sitting next to the scent, or by barking. A harness or long leash is applied to the dog at the point where the handler is going to start the search, and the harness is a conditioning tool to inform the dog that it is time to work, as was also indicated by Cramer (1968:21). This method is used internationally for dog training.

According to Stejskal (2013:5), training of a dog begins with presenting particular odours to the dog while, teaching him or her to display a particular alert when detecting that odour. This procedure is known as Pavlovian conditioning. The dog is motivated to perform a particular task and rewarded upon completion of this task. The dog will learn to detect a specific odour, and then receives a reward in the form of food or a dog treat. Throughout the procedure, trainers may use actual samples of what the dogs are being trained to follow, or they may use chemicals that simulate the scent. Initially, the dog may be trained in laboratory-like conditions, in which he or she is simply being taught to identify the odours. Once the dog is capable of doing this, scenario-based training may be given (Stejskal, 2013:5). This method mentioned by Stejskal (2013:5) is also known as the “food reward” method. In SA the operant conditioning process is used (ball reward), as indicated by Captain Bokka Nel (SAPS, 2007:4).

During training, it is vital that the dog be trained to give a positive indication by sitting next to the scent (or exhibit), or by barking. When the dog is on a real-time crime scene, there is no room for error or possible contamination of exhibits, hence the strict selection and assessment of these dogs (SAPS Training Manual on Dog Training, 2007:22). The imprinting of the 4 dogs for the K9 pilot training project phase took place by using pipes or cylindrical containers (i.e. the pipe

containing the sample was hidden among all the pipes that contain false samples, and the dog had to sniff in which pipe the sample had been placed). This phase took approximately 6 to 8 weeks to complete.

The BBFD Dogs are trained to sniff only human blood and semen. Some false samples are also used, such as animal blood (baboon, horse and cattle) in order to make sure that the dog does not give any false indications. It also ensures that the dogs react only to human blood, and not to various types of animal blood and semen (SAPS Research and Development Document, 2007:3). Substances chosen for training samples are human blood and semen, both being hazardous due to the possibility of being infected (hepatitis or HIV). Great care have to be taken when these substances are handled, e.g. by using protective gloves. The blood and semen are dropped on filter/blotting paper by means of a pipette - 50 µl (microlitre) on a 20 mm x 20 mm piece of filter paper, and air-dried in a sterile environment to prevent contamination. Tweezers are used to handle these substances to avoid contamination, and the samples are used only once and disposed of safely (SAPS Research and Development Document, 2007:3).

The K9 handlers for this K9 pilot training programme also had to attend the DNA Crime Scene Recovery course in order to acquaint themselves with basic forensic guidelines (when collecting evidence for DNA analysis). The main reason for this training was to avoid contamination of any evidence collected. Together with the forensic lab personnel, the K9 handlers used the BBFD Dog at simulated crime scenes and gained instant success.

Fogle (2006a:57) stated that dogs are capable of detecting even microscopic traces of substances, and from the research conducted by Captain Nel (SAPS Research and Development Document, 2007:3), we can see that the 4 BBFD Dogs had been trained to detect minimum traces of body-fluid (blood and semen). It is therefore quite clear that the BBFD Dog, once it is fully trained, is capable of being a very valuable tool for detectives on rape crime scenes. The dog will have the ability to sniff valuable evidence such as blood and semen, which would be a very vital piece of circumstantial evidence to link the suspect to the crime.

Geldenhuys (2006:36) in his article published in the SAPS magazine *Servamus* highlighted the discovery of the possibility of training the BBFD Dog, and used it as a marketing campaign to advertise this wonderful dog. It had to be marketed extensively for detectives to be aware of the existence of such a dog. However, more BBFD Dogs and handlers had to be trained across the country as the demand for their use grew.

The project team of Captain Bokka Nel and other K9 handlers who were used for the pilot training programme of the 4 BBFD Dogs then launched a country-wide campaign in 2006, and visited numerous detective branches to introduce the BBFD Dog. During their visits, a presentation was given regarding the use of the BBFD Dog as an aid in the investigation of crime scenes, thus saving on manpower, forensic chemicals, special UV lights, and time at crime scenes. The 4 trained dogs gave practical demonstrations of detection of minimum blood and semen samples. This was met by disbelief from seasoned detectives on the ability of the BBFD Dog to detect these samples almost anywhere (e.g. in the veld, bushes, grass, houses and vehicles (SAPS Research and Development Document, 2007:3).

The K9 handlers were overwhelmed with questions, and some investigators requested that the dogs be taken to older crime scenes where leads or evidence could not be found by the investigators. From the start it was made clear that the handler and the dog were there to aid and assist the detectives, forensic experts or LCRC members, and to make their work easier and not to take over their work (SAPS Research and Development Document, 2007:3). This aspect was also reiterated by both Rixon (2000:81) and Watson (1963:82) when they stated that a dog cannot fully replace a police officer, but can be used as an aid in their work.

After introduction of the dogs into the SAPS, it seemed that the BBFD Dog was a success for policing, due to the large number of requests received for the dogs to attend crime scenes. This was the start of the feasibility study into the effectiveness of BBFD Dogs. Captain Bokka Nel and Warrant Officer Hilpert, who was one of the handlers who had attended the pilot training programme, attended numerous crime scenes around the country. Every crime scene attended with the dog was analysed and documented in order to determine what had to be added to

or removed from the final training curriculum. This research phase took place during a period of 12 months in order to fine-tune the training curriculum (SAPS Research and Development Document, 2007:3). The first formal roll-out of the BBFD Dog course took place in January 2007 at Roodeplaat K9 Academy, in accordance with Division HRD's training provisioning plan (TPP) for Specialised Vispol, K9 and Mounted Training. A minimum of four K9 handlers were trained per year at the K9 Academy Roodeplaat (SAPS, 2007:1).

As mentioned earlier, according to the SAPS 96 Persal/Persap records, the researcher was the National Coordinator for K9 training in the SAPS Division HRD (Head Office), from January 2005 to April 2017, and was responsible for coordination of all K9 training in the SAPS (SAPS, 2018:3). The researcher, from his personal experience, can confirm that from 2007 until the present, approximately forty BBFD Dogs and K9 handlers have been trained by the SAPS K9 Academy Roodeplaat. The idea is to always have sufficient trained BBFD Dogs and K9 handlers to perform duties at the serious crime scenes of murder, rape and so forth (SAPS Training Provisioning Plan, 2007:3).

Since the inception of the BBFD Dogs there has been nothing but praise for the introduction of this dog, due to the many successes achieved by the dogs and their handlers at numerous crime scenes. This fact is confirmed by the monthly feedback reports submitted to the Division Visible Policing in respect of the productivity of all operational dogs and K9 handlers across the country. The statistics of the success and use of the BBFD Dogs are always positive (SAPS Dogmis Monthly Reports, 2016:4). The challenge facing the SAPS is non-utilisation of the BBFD Dog at numerous crime scenes where the dog could have been used (SAPS 6 Docket Analysis Booyens SAPS, 2014:2). The next paragraph elaborates on some of the successes achieved by the BBFD Dog at some actual/real crime scenes.

3.5.2 Crime scenes of interest attended by the biological body-fluid detection dog

The actual court cases referred to below show some of the successes achieved by the BBFD Dogs and the respective K9 handlers in rape cases from 2005 until the present. These cases were also properly recorded and documented by the

respective judges as legal and binding judgements. It is for this reason that the BBFD K9 handlers have to undergo DNA evidence collection training, which is presented by qualified experts from the SAPS Forensic Services, therefore they can be deemed to be semi-expert witnesses in court when cross-examined by the defence (SAPS, 2015:13). The K9 handlers also attend biennial proficiency testing as prescribed by the K9 and Mounted Services Directives on K9 training, as per National Instruction 4 of 2015 Dog Services (SAPS, 2015:13). The biennial proficiency testing entails refresher training and also testing the competence skill of the K9 handler for them to perform operational functions. This competence of the K9 handler is often questioned by the defence in court (hence the reason for proficiency testing), (SAPS, 2015:13). Below are some examples of reported cases attended by the BBFD Dog. For the purpose of this study and to protect the interests of all parties involved, fictitious police CAS numbers, names of places, and names of the K9 handlers will be used.

3.5.2.1 Case 1: SAPS CAS 10/06/2005 Cape Town

A four-year old girl was raped by a family friend when he volunteered to look after the children when the parents wanted to go out one night. When the parents returned, the girl was missing, and after calling out for her she returned in a bad state. She had been raped and slightly beaten. This crime happened on a Friday night, and the detectives summoned K9 handler Mark to assist in the investigation with his 2 BBFD Dogs. Due to the long distance he had to travel (from Pretoria to Cape Town in the Western Cape), Mark only arrived there on the Tuesday morning. The whole weekend, the crime scene had been exposed to a light drizzle of rain. The family lived on a wine farm and their house was located next to the vineyards. The investigating officer did not have enough physical evidence to obtain a solid conviction, and could not determine exactly where the child had been raped in the vineyards. After planning the search pattern, BBFD Dog Hendrik was used, and within 5 minutes he indicated a place in the vineyard about 400 metres from the house where the search had started. With the help of the LCRC Investigator, the point of indication by Hendrik was analysed, and a body-fluid sample (semen and blood) was collected. It was later confirmed that the semen was that of the suspect, and the blood belonged to the victim and the suspect was found guilty in this case (SAPS Cape Town CAS 10/06/2005:2005:3).

3.5.2.2 Case 2: State versus Andrew and three others (Eastern Cape CAS 332/04/2010)

The female complainant and her male companion were attacked in the dark in an old, abandoned house, by 5 men who had covered their faces with scarves and hoods. The complainant was brutally gang-raped more than once by all the suspects, and even robbed of her jewellery, and her companion was also extensively beaten up and robbed. The complainant was able to provide only one name, Jon, whom she assumed to be one Jon Jame. The complainant assumed incorrectly. She also claimed to recognise a second man, again incorrectly.

K9 handler Dave attended the crime scene the following morning. He meticulously searched the house with his BBFD Dog, Sasha, looking for clues and pieces of evidence that would assist in piecing together the crime scene. The complainant pointed out to Dave the piece of cardboard upon which she had been raped. Near it, Dave noticed a piece of cloth that was positively identified by Sasha. He forwarded the cloth and other exhibits to the forensic lab. The semen of accused 1 and 2 was isolated on the cloth. This positive finding persuaded accused no 2 to tender a guilty plea, and he subsequently testified against his co-accused. The accused were forced into this position as a result of overwhelming DNA evidence, which became available because of the forensic work conducted by Dave and Sasha. All accused were found guilty and sentenced to life in prison (S v Andrew and 3 others, Eastern Cape CAS 332/04/2010, 2011:4).

3.5.2.3 Case 3: SAPS Mpumalanga CAS 10/06/2009 (serial rapist)

A serial rapist had targeted women in the Mpumalanga region since 2009. He lured the women by offering them employment and then raping them. The suspect was arrested in January 2013 for 9 cases of rape. K9 handler Sergeant Peter and his BBFD Dog, Marky, attended all these rape crime scenes, and Marky detected and pointed out semen at most of the scenes. The semen was collected by Sergeant Peter from each crime scene and sent to the SAPS forensic lab for DNA analysis. The DNA found on the crime scene and the DNA in the control sample of the suspect matched, and the suspect was thus linked to the crime scenes. In September 2014, the suspect was sentenced to 322 years imprisonment on 12

counts of rape. Most of these cases took place in the veld and bushy areas (Laevelder Newspaper, 2014:3).

The above cases depict actual successes achieved by the BBFD Dog, and the evidence subsequently given in court by the dog handlers in these cases led to the conviction of the perpetrators. This is proof that the dog could be a valuable aid for detectives at a crime scene, for detection of vital body-fluid evidence. The next paragraph will focus on the types of evidence that the BBFD Dog could detect at a crime scene.

3.6 TYPES OF EVIDENCE THE BIOLOGICAL BODY-FLUID DOG COULD DISCOVER

The researcher is of the opinion that this is a unique study, since a trained dog is used as an aid in forensic investigation. During the literature study there was no data found in respect of a dog such as the BBFD Dog being utilised for forensic investigation purposes, except the one used by the SAPS. This is a hugely positive outcome for the SAPS, since the use of the BBFD Dog has been a success so far. The next paragraph depicts the types of evidence that the BBFD Dog could assist to detect at a rape crime scene.

3.6.1 Forensic evidence

White (2007:3) indicates that in the UK, use of forensic science started in the early 1900s. Body-fluid samples were found to contain information that could help identify an individual. Scientists such as Karl Landsteiner discovered the presence of deoxyribonucleic acid (DNA) in human chromosomes that created dramatic improvements in identifying an individual (White, 2007:3). In 1910, the scientist Edmond Locard asserted that every contact leaves a trace, e.g. fingerprints or body- fluid, which might be present in trace amounts only, but can directly implicate a particular person in a crime. Today, this is known as the “Locard Principle” (White, 2007:3).

The ability nowadays to be able to analyse such a variety of materials stems from technological advances that have occurred particularly in the past fifty years. Many of the analytical techniques that have been devised offer unbelievable sensitivity and permit examination of minute quantities (traces) of material that cannot be

observed directly by the human eye (White, 2007:3). The Irish Veterinary Journal (2006:1) also agrees that dogs are capable of detecting body-fluid evidence that even instruments can never detect. The BBFD Dog can detect the smallest amount of DNA evidence at a rape crime scene (e.g. blood or semen), and this evidence will be vital in linking the suspect to the crime.

3.6.2 Body-fluid evidence

Blood is a very common clue in many of the more serious crimes, e.g. murder, robbery and rape. Although fresh blood is easy to discern, its appearance can be altered after even a short time, by sunlight, heat, airborne bacteria etc., and then it will be difficult to recognise. Blood that was removed by washing or that was covered with paint may go unnoticed, unless suspicion of such a situation is aroused. Forensic labs in the USA use simple field tests, known as presumptive tests, with some chemicals to detect this blood (Osterburg & Ward, 2010:65).

Forensic serology is the identification of bodily-fluids commonly found at crime scenes. Blood, semen and saliva are the most valuable and common bodily-fluids found (SAPS, 2012:10). Houck and Siegel (2011:233) also agree with Osterburg and Ward (2010:65) about the evidential value of blood, and they define blood as a tissue composed of several types of cells in a matrix called “plasma.”

Semen is a complex, gelatinous mixture of cells, amino acids, sugars, salts, ions and other materials produced by post-pubescent males and is ejaculated following sexual stimulation (Houck & Siegel, 2011:239). The volume of ejaculate varies from 2 to 6 mm and typically contains between 100 and 150 million spermatozoa or sperm cells. Sperm cells contain a head with DNA and a tail that wiggles or flagellates to produce movement (Houck & Siegel, 2011:240).

Fisher and Fisher (2012:207) state that one of the most probative pieces of evidence in dealing with sexual assault cases is the presence of semen. It is usually found on bedding, clothing, tissues, towels, condoms and so on. An alternate light source is often used to locate semen stains, due to semen’s fluorescent properties under certain wavelengths of light. Once possible semen is located, a presumptive test is performed to determine whether the stain is presumptively positive for semen (Fisher & Fisher, 2012:208).

Fisher and Fisher (2012:207) and Houck and Siegel (2011:240) state that semen is a vital piece of evidence, but they caution that semen and sperm are not synonymous. Semen is the viscid, whitish fluid, and sperm are “tadpole-like” organisms that are contained in and travel through the semen to fertilise the female egg. This distinction is important because the laboratory examination and tests employed in the search for each are quite different (Gilbert, 2007:305).

Fisher and Fisher (2012:207) and Houck and Siegel (2011:240) state that body-fluid evidence is pivotal evidence in serious crimes, and this evidence can make or break a case in court. These writers are American, and they write about the special Ultraviolet (UV) light and chemicals that are used by their policing agencies to detect this body-fluid (blood and semen) at crime scenes in the USA. It is thus clear that the USA does not have the BBFD Dog at its disposal. White (2007:306) states that a portable ultraviolet lamp (black light) would be able to detect semen, since the latter would fluoresce under the ultraviolet radiation.

According to Osterburg and Ward (2010:69), DNA technology took off in 1985 in the USA, and caused a stir in the world of forensic scientists, prosecutors and defence attorneys. Particularly in rape cases, prosecutors see the possibility of presenting positive DNA (semen) results as associative evidence or proof that the defendant’s ejaculate was present at the crime scene or on the victim’s clothing or body. The linkage of the suspect to a crime scene has strong probative value and is likely to be persuasive to a court. DNA analysis is regarded by some people in law enforcement as the greatest breakthrough since the advent of fingerprinting and the computer. Today, the courts in all fifty states of the USA allow DNA test results to be admitted as evidence (Osterburg & Ward, 2010:69).

During analysis of the 20 case dockets at the Booyens SAPS, the researcher examined the following aspects pertaining to the collection of evidence at a rape crime scene:

- The evidence that was collected and how it was discovered: Fifteen of the 20 dockets were opened at the police station itself, where the complainant walked into the station to open

the rape case. This implies that the crime scene was never visited by any SAPS official, and no physical evidence was obtained, since the crime scene was not visited. The victims were taken for medical examination in 5 of the cases. In all 5 cases, physical evidence was obtained from the victims (semen samples), using the standard rape crime kits.

- Analysis of the collected evidence in the forensic lab and results thereof: The docket analysis indicated that in the 5 cases where victims were sent to the medical practitioner, the evidence was sent to the forensic lab for analysis. There were forensic results from the lab for only 3 of these 5 dockets. The report confirmed that the evidence was in the form of semen, and there was no evidence of a match to any possible suspect.
- Whether the BBFD Dog was used for any of these rape cases: From the perusal of these 20 dockets, it transpired that the BBFD Dog had been called out for 2 of the cases. However, there were no proper records regarding the outcome of the use of the dog.

The above analysis of the case dockets and the literature denotes that evidence is required in order to effect arrests and secure a conviction of the perpetrator. If the crime scene is not visited by the detectives, valuable evidence is overlooked. The BBFD Dog could be a valuable investigative aid for the detectives if utilised more frequently. This is confirmed by the successes of the BBFD Dog as discussed in paragraph 3.5.2 above, where the BBFD Dog carried out some excellent detection work at these crime scenes.

The challenge facing many investigators is the lack of or difficulty in detecting evidence. In other countries, the police investigators use UV lights, as indicated by Fisher and Fisher (2012:207) and Houck and Siegel (2011:240). However, the use of these lights is costly and time-consuming. Fisher and Fisher (2012:207), Houck and Siegel (2011:240) and Osterburg and Ward (2010:65) all agree that body-fluid such as blood and semen is the most important evidence at a rape crime scene. The next section will provide an overview of the use of the BBFD Dog for rape crime scenes.

3.7 ROLE AND USE OF THE BIOLOGICAL BODY-FLUID DETECTION DOG AT RAPE CRIME SCENES

Stejskal (2013:5) states that during the actual fieldwork, the dog's handler must aid the dog in any possible way. This includes utilising any known information as well as the handler's own experience in developing a search plan that will give the dog the best opportunity to locate the desired odours or scents. Allowing a dog to randomly move around and sniff a huge area may yield no results, or it will take an extremely long time for the dog to locate the target of the search. In outdoor areas, odours may drift and pool in lower areas or up against physical barriers, therefore especially these locations should be searched. Every search area should be treated as a potential crime scene. Accurate records must be kept of the entire search, including the trainers and canines involved, the area covered by the search, and any findings (Stejskal, 2013:5-6). Captain Bokka Nel SAPS (2007:7) and the SAPS Dog Training Manual SAPS (2007:12) also highlighted the importance of using the correct type of dog to be trained as a BBFD Dog. The dog has to work in all types of environments, for example houses or other buildings, vehicles, large veld or dense bush areas, grass, sand, and many more surfaces. Eden (2017:1) states that crimes against persons often occur in one area and that sometime the victim either escapes or is allowed to leave. The trauma, shock and general confusion related to the incident make it difficult for the victim to locate the scene again afterwards. In cases such as a murder, the body is often moved in an attempt to mislead police, and this is where police service dogs are able to help to locate the crime scene. In many cases, according to Eden (2017:2), the police service dogs, such as tracker dogs, use the scent of the suspect or victim and are able to go into an area and pinpoint the scene for investigators.

Harel, Khairkar, Kulkarni and Malve (2015:1) state that the number of rape cases, is increasing drastically, therefore the detection of sperm or semen, even if present in small quantities, is of paramount importance in investigating these cases. Harel et al. (2015:1), further state that the sperm and semen, no matter how old they are, can be detected at the crime scene by using very high-powered Ultraviolet-Visible Spectroscopy light (UV-VIS) sources and chemicals. The semen responds to illumination by longer-wavelength frequencies of UV light, which are invisible to the human eye. The light can make the invisible semen stains appear

visible to the human eye, and chemical tests will confirm that they are indeed semen (Harel et al., 2015:2).

The use of these lights and chemicals, according to Gilbert (2007:292) and White (2007:382), is extremely costly, labour-intensive, and will require the detective to know which area to search. It will not be possible to search a large crime scene area using specialised lights, according to Gilbert (2007:292) and White (2007:382). The argument of Harel et al. (2015:1), that UV-VIS lights can be used to detect traces of body-fluid at a rape crime scene, and the views expressed by Gilbert (2007:292) and White (2007:382) that it is costly, labour-intensive and difficult to detect evidence with the UV lights, all make a good case for the use of the BBFD Dog to perform the same function and be used to detect the body-fluid evidence at crime scenes.

Due to the extremely high number of rapes reported in Gauteng (and especially Booyens), the Provincial Commissioner of Gauteng, Lieutenant General Petros (at the time) issued a Provincial Instruction that the BBFD Dog and handler must be present at the investigation of all rape scenes in the Gauteng province (SAPS, 2013:1). The challenge associated with such a type of instruction is that the BBFD K9 handlers are often overworked, since Gauteng province does not have many of these dog handlers. According to Division Visible Policing Strength of Working K9 at Provinces (SAPS, 2015:6), Gauteng province has 4 active BBFD K9 handlers. The same document from Visible Policing indicates that at least 10 BBFD K9 handlers and dogs are required for Gauteng province, due to the high rate of serious and violent crimes such as murder, armed robbery and rapes. Although Gauteng is not large in terms of geographical area size, such as, for example, the Northern Cape, it has a very large and dense population.

The participants in Sample A, B and C were asked to describe any experience they had in the use of the BBFD Dog in their work environment. This was an open-ended question, to which the participants could provide their own answers and no choices were provided from which they could choose. The responses from the participants were as follows:

Sample A participants responded as follows:

- Nine of the detective participants had no experience with the BBFD dog.
- Four indicated that the dog and handler are called out to the murder and rape crime scenes so that the dog can sniff out evidence that a human being is not able to detect.
- Two participants said they had witnessed the dog working at some crime scenes, that the dog and its handler have a good working relationship, and that the dog always follows instructions of its handler.
- One participant stated that the dog is called out to rape crime scenes as per the provincial instruction.
- One participant stated that when he is on standby, he calls out the dog for rape cases mainly in the veld areas, as it is hard to see and detect evidence in the grass or ground.
- One participant relayed the story of how he attended the case of a missing elderly woman, and the dog searched the premises and detected the woman's body in a shallow grave in the backyard.
- One participant stated that he had attended a rape scene inside a room where there were many blankets, and the BBFD Dog had easily sniffed and detected semen in the one blanket, which was then sent to the lab for analysis.
- One participant stated that there is poor communication between the K9 Unit and the detectives, and this result in non-attendance of the dogs in rape cases.

Sample B participants responded as follows:

- Two participants stated that they had used their BBFD Dog to assist detectives at rape and murder scenes, to indicate the presence of blood or semen traces that are not visible to the human eye.

- One participant indicated that he had used his BBFD Dog to search a suspect's home (bedroom), and the victim's blood had been found in the room. This evidence placed the victim at the scene.
- One K9 handler from Gauteng province stated that from January 2011 to August 2014, he and his BBFD Dog had attended 353 cases, which included murder and rape, and the dog had found various samples in all kinds of areas.
- One K9 handler from Mpumalanga province quoted 3 actual cases he had attended with his dog, including 1 farm murder, with 2 arrests and convictions, a serial rapist with 1 arrest and conviction, and a rapist/murderer with 1 arrest and conviction.

Sample C participants responded as follows:

- Four participants had no direct experience with the dog.
- One participant stated that he had witnessed the dog searching a car in the scrapyard and the dog had detected blood very quickly.
- One participant stated that the Biological section of the forensic laboratory very often receives exhibits that have been identified by the dog, and the forensic analysts conduct presumptive testing of these exhibits.

The response from Sample A, i.e. the detective participants, indicates that 11 of them had had some experience with the BBFD Dog, and 9 of them indicated that they had no experience with the dog in their work environment. Most of the detective participants agreed that the BBFD Dog could be very useful at a rape crime scene, especially to detect body-fluid evidence at difficult crime scenes. Participants from Sample B gave very positive feedback to this question, since they are involved in using the dog as part of their operational duties. The 1 participant gave an indication of the many cases attended by him and his BBFD Dog during the period January 2011 to August 2014, when they had attended to

353 cases. One participant also recounted the successes of his dog in rape and murder cases that resulted in successful convictions. This is an indication of the usefulness of the BBFD dog, and the huge successes achieved, as highlighted by participants from Sample B.

Sample C participants had no direct experience with the BBFD Dog, although 1 participant did mention that the lab often received exhibits for analysis that had been detected by the BBFD Dog at the various crime scenes. The views of the participants regarding the use of the BBFD Dog are similar to those stated in the literature, where Eden (2017:2) explains the importance of tracker dogs.

The participants in Samples A, B and C were also asked the following question: What contribution has the BBFD Dog made to the execution of your duties? This was an open-ended question to which the participants could provide their own answers and no choices were provided from which they could choose. The responses from the participants were as follows:

Sample A participants responded as follows:

- Six detectives stated that using the dog could contribute in detecting evidence at the rape scene. The evidence is sent to the lab and will help to link the suspect to the crime.
- Six detective participants stated that the dog could contribute to strengthen and speed up the case or investigation and obtain a conviction because of the evidence detected by the dog.
- Three detective participants indicated that the dog could detect evidence that is not normally visible with the naked eye, even tiny amounts, and the dog is able to work in a huge area, which saves time and money.
- Three participants were not sure.
- One detective participant stated that when the LCRC uses the UV lights to search for human body-fluid, the dog is an extra tool and will guarantee that the area is searched properly.

- One participant stated that the dog could make a difference between a conviction and a “not guilty” verdict.

Sample B participants responded as follows:

- Three of the participants stated that the dog could detect minute amounts of blood or semen at a crime scene that would not be visible to the human eye, and sometimes this might be the only evidence available at that crime scene.
- One participant stated that the dog could successfully search for semen in large areas, and this reduced the huge cost of using chemicals and UV lights.
- One participant stated that a victim might be raped by between 2 to 9 suspects in areas near highways, public toilets, informal settlements, etc. The BBFD Dog could work quickly and efficiently in these areas, and be capable of locating the evidence in areas containing grass, sand, walls, carpets, etc.

Sample C participants responded as follows:

- Four of the participants stated that by using the dog, detection and collection of exhibits from the crime scene would lead to more evidence being analysed at the lab, which would result in more convictions or successes.
- One forensic participant gave a very interesting response. This person indicated that the dog could identify relevant exhibits at the crime scene, even if the scene has been cleaned up.
- One participant was not sure.

To this question, 17 of the 20 detective participants gave very positive feedback pertaining to what contribution the BBFD Dog could make to the execution of the detectives’ duties. These participants also stressed the vital role that the BBFD Dog could play in detecting the evidence, which is found in extremely small amounts that are usually not visible to the naked eye. One detective participant

mentioned that LCRC members use UV lights at the crime scene to detect evidence, but that the BBFD Dog might be more useful to do the work. This participant agreed with the views of Gilbert (2007:292) and White (2007:382).

All 5 of the Sample B participants strongly agreed that the BBFD Dog could make a huge contribution by executing its duties. These participants also indicated that the dog was capable of detecting minimal amounts of evidence in any type of area, and would save on the cost of expensive UV lights. The response from the Sample C participants was also very positive, in that most of them agreed that using the BBFD Dog would result in more evidence being collected from the crime scene and sent to the lab for analysis.

As mentioned above, 1 participant from Sample C gave a very interesting response when he stated that the dog can identify relevant exhibits at the crime scene even if the scene has been cleaned up. This point is correct as indicated by this participant. The events in one actual murder case attended by the BBFD Dog and his handler, Warrant Officer Micks (fictitious name) in Kwa-Zulu Natal were as follows: The suspect committed a murder and blood had been spilt all over his jeans and shirt. Later on, the suspect soaked and washed the blood-stained clothing in water and Surf, and the clothing was clean again. Warrant Officer Micks received information and he and his dog conducted a search of the suspect's house two weeks after the crime. The dog detected the blood on the same clothing that this suspect had washed. Forensic analysis positively linked the suspect to the murders and he was convicted in court.

The participants in Sample A, B and C were furthermore asked to state the advantages of using the BBFD Dog at a rape scene. This was an open-ended question to which the participants could provide their own answers and no choices were provided from which they could choose. The responses from the participants were as follows:

Sample A participants responded as follows:

- Nine of the participants stated that the BBFD Dog was very useful because it could find even tiny amounts of

body fluid that could not be seen by the naked eye, and it could cover a large area in a short time.

- Three participants indicated that the BBFD Dog could help with DNA case linkage and individualisation, as well as to solve serial rape cases and connect the suspect to the crime by means of the DNA evidence recovered.
- Three participants indicated that the BBFD Dog could cover a large area and detect evidence at a crime scene. The dog's success rate has been excellent.
- Three participants indicated that they did not know.
- One participant stated that the BBFD Dog's accurate indication of the evidence at a crime scene saved time and could corroborate the statements of witnesses and the victim.
- One participant stated that the BBFD was an advantage when an investigator was looking for a condom or clothing on the crime scene.

Sample B participants responded as follows:

- Two participants indicated that the dog could detect a small amount of semen, work very fast and save time. The dog was trained to detect only human body- fluid.
- One participant stated that when a blanket has been collected as an exhibit, there was no need to take the whole blanket to the lab. The piece indicated by the BBFD Dog could be cut off and sent to the lab.
- One participant said that the BBFD Dog could be used to search a specific area. The dog led the way and could detect any trace of semen at the rape scene. Members of the investigating team should avoid walking around at the crime scene.
- One K9 participant stated that the Blue Star is a special light to detect evidence, but it can work only at night.

He added that the BBFD Dog is trained to detect only human body-fluid, whereas other presumptive tests also react to animal blood.

Sample C participants responded as follows:

- Four of the participants stated that the use of the BBFD Dog saved time and was efficient, since the dog could carry out the search in a short time and cover a large area.
- One participant stated that a large area could be searched in a short time. In areas where fluids were not visible, the dog would point them out.
- One participant stated that more evidence could be collected that contained DNA, saving time and money by not collecting unnecessary exhibits.

Sample A participants responded very positively to this question, with 17 indicating that the use of the BBFD Dog would be a huge advantage to the detectives and 3 did not know. The main aspects highlighted by the participants were (1) the huge area the dog could cover in a short space of time, (2) that the dog could detect very tiny amounts of body fluid, and (3) that the discovery of this evidence could link the suspect to the crime by means of individualisation. All 5 of Sample B participants stated that the BBFD Dog was a distinct advantage at a crime scene such as rape. One important aspect mentioned by 2 of the participants is that the BBFD Dog had been trained to detect only human blood and semen, whereas the presumptive test and UV lights could identify any type of blood (including that of animals). All the Sample C participants agreed that the dog was a huge advantage, since it could search a large area quickly and save a lot of time.

The literature and response from the participants confirm the value or contribution that the BBFD Dog could add to the investigation of rape. Eden (2017:1) and Stejskal (2013:5) highlighted the important role that dogs play in the investigation of crime. Stejskal (2013:5) argues that the dog would be very valuable if led in the correct manner by the handler, and Eden (2017:1) gave good examples of how the Tracker Dog could successfully detect a crime scene, using scent. Similarly, the BBFD Dog was trained to successfully detect body-fluid evidence at a crime

scene, as indicated by the participants of Sample B. Harel et al. (2015:1), emphasised the importance of retrieving semen as a source of evidence at a rape crime scene, and they further elaborated on the use of sophisticated UV lights to identify the semen stains. Gilbert (2007:292) and White (2007:382), as well as some of the participants of Samples A and B also mention the use of UV lights to detect semen. However, they warn that this is rather costly and may not always be successful at larger crime scenes, due to the labour-intensive nature.

Based on the success of using dogs for police work, as indicated in the literature by Eden (2017:1), Stejskal (2013:5) and the responses from the participants of Samples A, B and C, the researcher can confidently say that the BBFD Dog would be an invaluable investigative aid at any rape crime scene to detect body-fluid evidence. The researcher is of the opinion that the BBFD Dog would be more effective in detecting body-fluid evidence, compared to the methods indicated by Harel et al. (2015:1). These include the use of UV lights and chemicals to detect semen that is not visible to the human eye. The BBFD Dog has been used in many criminal cases to rapidly detect such body-fluids at numerous crime scenes. In some of these cases, the evidence was detected long after the crime had been committed, and even after the suspect(s) had attempted to destroy the evidence.

The participants from Samples A, B and C stated that the BBFD Dog was capable of detecting minimum amounts of body-fluid evidence at a crime scene. That is significant for this study, because Gardner (2012:32) and Osterburg and Ward (2010:75) all stated that with the use of PCR and STRS DNA test techniques, as little as 1 ng of DNA could be used for testing and analysis at the lab. The SAPS forensic service is currently using the STRS method for analysis of DNA samples, as mentioned in paragraph 2.10 of this study, which has shown that the BBFD Dog is capable of detecting minimum amounts of body-fluid at a crime scene. This may be the only physical evidence available, and detectives or forensic experts may not be able to find it with the naked eye. This shows what a vital role the BBFD Dog could play to gather DNA evidence at a rape crime scene.

The views of the participants of Samples A, B and C regarding the three questions that were posed to them in this section were very similar to those of the Irish Veterinary Journal (2006:1), Eden (2017:1) and Stejskal (2013:5). These sources

all provided different explanations and examples of how valuable dogs could be to their various policing agencies and the participants from Samples A, B and C provided sufficient information and examples regarding the BBFD Dog, which is currently being utilised only by the SAPS. The next section will focus on the non-utilisation of the BBFD Dog by the SAPS and the subsequent results.

3.8 NON-UTILISATION OF THE BIOLOGICAL BODY-FLUID DETECTION DOG BY THE SAPS AND THE SUBSEQUENT RESULTS

Gilbert (2007:283) states that rape investigation poses many difficulties to the criminal investigator. Not only is it impossible to prevent the crime, but its socially sensitive nature often generates information-gathering difficulties. Gilbert (2007:283) further states that rape has been the fastest growing of all crimes against the person, yet it has also resulted in the lowest proportion of suspect convictions, following arrest. Osterburg and Ward (2010:429) state that the success of the investigation of rape depends on the collection of physical evidence. The nature of proof in sexual offences, unlike most other crimes, has traditionally required some form of corroboration, other than the victim's testimony.

Benson and Horne (2011:3) state that physical evidence is always present at crime scenes, and the fact that it may not always be possible to see or find the physical evidence without special equipment does not imply that it is not there. Benson and Horne (2011:2) further state that only a few crimes rely upon physical evidence as heavily as does the crime of rape, therefore in order to secure a conviction in court it has become ever more important for detectives to focus on the recovery of physical evidence during the crime scene investigation process. Gardner (2005:23) states that physical evidence has a superior credibility and weight in comparison to testimonial evidence defining what happened in any crime. Butler (2005:33) expounds on this viewpoint by stating that physical evidence holds a number of advantages over testimonial evidence, because of its concrete nature. Gardner (2005:348) specifically points out that the one straightforward difference between testimonial evidence and physical evidence is that people lie and misperceive, therefore testimonial evidence, though important, is neither the strongest nor the most objective evidence. Physical evidence, on the

contrary, if properly collected, evaluated and correlated, has the power to establish facts during an investigation that nobody can refute.

The SAPS National Instruction 3 of 2008, pertaining to investigation of rape and other serious crimes, and the South African Police Service Act, 1995 (68 of 1995) mandates the SAPS to investigate cases of rape and guides detectives and police officers on how to handle these offences. The police have to utilise all available resources to investigate these cases to the best of their ability. The Minister of Police, Mr Mbalula, indicated that all crimes against women and children, more especially rapes, domestic violence and murder, have to be taken seriously, and that no woman must be refused assistance at the police station in such cases, as per Press Statement by Police Minister (SAPS, 2017:2).

The participants in the study were asked the question whether there were any disadvantages to not, using the BBFD Dog on a crime scene. This question was relevant to all the participants. It was an open-ended question to which the participants could provide their own answers and no choices were provided from which they could choose.

Sample A participants responded as follows:

- Eleven of the participants stated that it would definitely be a disadvantage, since it would make the investigating officers' work more difficult with regard to detecting evidence, because body-fluid cannot be seen by the naked eye, but the dog could detect this evidence.
- Four participants said that it would be a huge disadvantage if the BBFD Dog were not used, as vital evidence or clues would then not be collected from the crime scene.
- Three participants stated that the human eye is not as good as that of the BBFD Dog, and without using the dog on the crime scene it would be difficult to collect biological evidence. This would lead to fewer convictions.

- One participant indicated that the crime scene could be contaminated but that the BBFD Dog could be used and would be effective in any kind of environment, e.g. rain, wind or sun.
- One participant was not sure of the disadvantages of not utilising the BBFD Dog.

Sample B participants responded as follows:

- One participant stated that DNA evidence (semen) is not visible with the naked eye and might therefore not be collected if the dog was not used. This could be the only evidence linking the suspect to the crime.
- One participant stated that if the dog were not used it would be extremely hard to detect evidence in places such as inside a vehicle, or on carpets, where evidence cannot be seen by the naked eye. This would result in bulky items being sent to the lab for analysis.
- One participant indicated that by not using the dog, crucial evidence could be overlooked that is not visible to the human eye. The crime scene could be contaminated and destroyed if the dog is not used, and detectives would lose the case in court.
- One participant stated that he used his BDFD Dog at all crime scenes he was called out to. If the dog were not used, DNA evidence could be compromised by sun, rain and time delays.
- One participant stated that by not using the dog, vast amounts of time and resources could be wasted, since the dog makes it much easier to find evidence.

Sample C participants responded as follows:

- Five of the forensic analyst participants stated that it would be a huge disadvantage if the dog were not used, as time would be wasted and a lot of unnecessary exhibits would be sent to the lab for analysis, resulting in higher costs and time-consuming work.
- One forensic analyst participant was not sure.

The literature discussion makes it very clear how important physical evidence is in rape investigations. Benson and Horne (2011:3), Butler (2005:33), Gardner (2005:23), Gilbert (2007:283) and Osterburg and Ward (2010:429), have all reiterated the importance of physical evidence to prove a rape case. The detectives cannot rely only on the oral evidence of witnesses but must ensure that physical evidence is obtained in order to prove these cases. This was the main problem that the researcher identified in the problem statement of this study. The detectives at the Booyens SAPS failed to collect physical evidence at the rape crime scenes, and this resulted in the minimum number of arrests and conviction of suspects in the cases opened.

The researcher has shown in this research study the processes linked to the objectives of criminal investigation, which include forensic science, the crime of rape, crime scene, evidence at a rape crime scene, DNA evidence, and identification and individualisation. All these aspects are interrelated and form part of the objectives of the criminal investigation process. If the detectives at Booyens SAPS applied these methods and techniques of criminal investigation effectively, they would contribute to a more successful investigation, arrest and conviction of the suspects in the cases investigated.

Of the 20 participants in Sample A, 19 agreed that it would be a huge disadvantage if the BBFD Dog were not used at rape crime scenes. These participants stated that the dog could detect evidence that is not visible to the human eye, and non-utilisation of the dog would result in evidence being discarded or ignored. All 5 Sample B participants agreed that it would be a huge disadvantage to the SAPS if the BBFD Dog were not used at the crime scene. They added that the dog could search in any type of area or terrain and use of the dog would save on resources. Five of the six participants of Sample C stated that it would be a huge disadvantage if the BBFD Dog were not used, since many unnecessary exhibits would be sent to the lab for analysis. This would result in unnecessary costs and wasted time.

The researcher can therefore confirm that Sample A, B and C participants are in agreement with the views of the authors in the literature, namely Benson and

Horne (2011:3), Butler (2005:33), Gardner (2005:23), Gilbert (2007:283) and Osterburg and Ward (2010:429) as regards the importance of physical evidence in a case of rape. The non-utilisation of the BBFD Dog at rape crime scenes may result in non-retrieval of physical evidence, which is required to prove the case. When the researcher was carrying out the docket analysis at the Booyens SAPS, one of the aspects that he investigated during perusal of the 20 dockets was whether the BBFD Dog had been used in any of these rape cases. It was determined that the dog had been used in only 2 of the cases. The researcher can therefore deduce that non-utilisation of the BBFD Dog may have resulted in no detection of physical evidence at those crime scenes, and ultimately no arrests of suspects.

From some of the challenges mentioned in this research, such as the police officials' failure to visit a rape crime scene (i.e. when the complainant arrives at the police station to report the case), the shortcomings in the police actions were discovered. However, in some instances the complainant only opened the case a few days after the incident occurred. This does not mean that the crime scene cannot be visited and inspected for physical evidence, since in one case mentioned in this study. It was shown how the BBFD Dog still detected blood on a suspect's jeans a few days after the suspect had washed his clothes to destroy this evidence. Police members at station level and the detectives have to complement one another and improve communication with each other. When cases of rape are opened, the first responders must ascertain whether a detective should be called out, and the detective member should ensure that he visits the crime scene. The BBFD Dog or any other forensic experts must be called out, if necessary, as stipulated in National Instruction 3 of 2008.

3.9 SUMMARY

This chapter highlights the BBFD Dog and the enormous value the dog could add to forensic investigation. The literature has confirmed the use of dogs as an investigative aid for many policing functions and other dog disciplines, and it was also confirmed that the SAPS is currently the only policing agency that makes use of the BBFD Dog. This study has also shown that utilisation of the dog could result not only in the successful detection of the body-fluid evidence, but also save on

time, resources and expensive chemicals, which do not always yield positive results. The participants from Samples A, B and C for this study have emphasised the significant role the BBFD Dog could play in rape investigations. The participants strongly agreed with the authors in the literature on the importance of physical evidence for rape investigations, and indicated that the BBFD Dog is an invaluable investigative aid to detect physical evidence at rape crime scenes.

The selection, training and use of any police dog are costly and require patience. However, the positive results achieved by the dogs are well worth the effort. This is evident from the actual cases that have been attended by the BBFD Dogs and handlers, as mentioned in this study. The recent crime statistics released for the 2016/2017 financial year showed an increase in violent and contact crimes, as compared to previous years, and the police have to consider all avenues to curb these escalating crimes (SAPS, 2017:2). One such aid for the SAPS might be the more optimal use of the BBFD Dog when serious and violent crimes are investigated.

The researcher is of the opinion that the BBFD Dog might be used internationally when its existence becomes known to other agencies. The aim of this research was to determine how the BBFD Dog could assist detectives in the investigation of rape cases. The researcher is of the view that further research is required in this field, i.e. on the use of the BBFD Dog for investigation of rape cases, the reason being that very little literature is available on this topic. The dog could be used for detection of body-fluid for other serious and violent crimes as well, hence the need for more research to determine the value of dogs for forensic investigations.

CHAPTER 4

FINDINGS AND RECOMMENDATIONS

4.1 INTRODUCTION

The aim of this research was to determine how the BBFD Dog could assist detectives in the investigation of rape cases. The researcher also intended to empower detectives and enhance their investigative skills with regard to the investigation of rape cases. One way to achieve this was to create awareness about the BBFD Dog as well as the value this dog could add in criminal investigations such as rape and murder. In order to achieve the aim of the research, the researcher asked the following research questions:

- What does criminal investigation entail?
- How is a BBFD Dog used during the gathering of DNA evidence in rape investigations?

The researcher addressed these research questions by collecting and analysing data from both local and international literature, conducting interviews with sampled participants, and carrying out a docket analysis of 20 rape dockets at the Booyens SAPS. The findings of this research relate to the research problem, the research aims and the research questions. Recommendations will be made based on these findings.

4.2 FINDINGS

Based on the literature used, the interviews conducted with Sample A, B and C participants, and the docket analysis, the researcher made the following findings.

4.2.1 Primary findings

The primary findings answer the main research questions of this study.

4.2.1.1 Research question 1: What does Criminal Investigation Entail?

The aim of this research was to determine how the BBFD Dog could assist detectives in the investigation of rape cases. The following was found:

- According to the literature, criminal investigation is conducted in a place or at a scene where a crime occurred, and the police then gather information to solve the crime and bring the suspect to book. Criminal investigation involves, among other things, the process of discovering, collecting, preparing, identifying and presenting evidence to determine what happened and who was responsible.
- The various authors have described the objectives of crime investigation as follows: identification of the crime; gathering of evidence; individualisation of the crime; arrest of the suspect; recovery of stolen property; and involvement in the prosecution process. All these actions are carried out by the investigating officer to ensure proper investigation and prosecution of the suspect. The response from Sample A participants regarding the objectives of crime investigation was fair. Although the majority of these participants had an idea of what the objectives of crime investigation entail, their explanations were vague. Sample B and C participants gave good explanations of this concept.
- According to the literature, forensic science can be described as the application of scientific methods in the investigation of crime and the examination of physical exhibit material at the forensic laboratory. Forensic science comprises the following phases: recovery of evidence from the crime scene; forensic examination of evidence recovered from the crime scene, and the presentation of scientific test results in court.
- The SAPS has a dedicated unit that deals with victims of rape, i.e. the Family Violence, Child Protection, and Sexual Offences Unit (FCS). From the docket analysis carried out by the researcher it was discovered that the local detectives at Booyens SAPS rarely call out the FCS members for rape cases from the start when the cases are reported. The first responders at Booyens SAPS handle the rape scenes and fail to gather sufficient physical evidence, and only call the FCS members later on to sign for the rape dockets. In most instances, the complainant opens the docket at the station and the crime scene is not visited or examined, as discovered by the researcher during the docket analysis at Booyens SAPS.

- Snyman (2014:343) defines the new Sexual Offences and Related Matters Amendment Act, 2007 (32 of 2007) that was introduced in 2008.

In SA, rape was previously defined as a common-law crime, but it is now covered by this new Act (as per Statutory Law). Only 4 of the 20 participants in Sample A made reference to the Sexual Offences and Related Matters Amendment Act, 2007 (32 of 2007) when they were asked what their understanding of the crime of rape is. None of the participants in Sample B or C referred to this new Act. This is an indication that the police officers lack knowledge of this Act and the correct definition of rape.

- A crime scene can be described as the location where a suspected criminal offence took place. The crime scene will contain physical evidence, which may be visible to the naked eye or may be microscopically small. The crime of rape consists of two crime scenes, namely the place where the crime took place, and secondly the victim's and suspect's bodies. This aspect is best described by the Locard Principle, which assumes that every contact leaves a trace.

4.2.1.2 Research question 2: How is a biological body-fluid detection dog used during the gathering of DNA evidence in rape investigations?

To answer this research question, the researcher sought to determine how dogs were being used for police work, i.e. the training, selection and evaluation of police dogs, and the use of the BBFD Dog by the SAPS. The following was found:

- According to the authors in the literature, dogs are widely used across the world by the various policing agencies for the detection of the respective substances that they are trained for. These include explosives, narcotics, search-and-rescue operations, detection of bodies or missing persons, and so forth. As a result of the use of police dogs, some of the sophisticated machinery and technology have been replaced, since dogs are more successful, especially in larger search areas. Sample B participants confirmed that the BBFD Dog is unique to the SAPS. This dog has been trained to detect body-fluid such as blood and semen at a crime scene.

- The dog's sense of smell is one of its most acute senses, which is capable of detecting odours that even the most advanced technology cannot register. The authors state that a dog interprets the world predominantly by smell, whereas a human does so by sight. It is asserted that a dog's sense of smell is approximately 100 to 10 000 000 times more sensitive than that of a human, hence the dog is trained to detect a certain substance by the process of "imprinting."
- The first 4 BBFD Dogs in the SAPS were trained in 2006 and were piloted in various cases. The dogs proved to be very successful in the detection of body-fluid evidence at various crime scenes. The dogs were then deployed to the SAPS K9 units around the country. The participants were asked what their understanding of the BBFD Dog is, and 18 of the Sample A participants had knowledge of this dog. All the participants of Samples B and C had knowledge of the BBFD Dog.
- During the docket analysis at the SAPS Booyens, the researcher perused 20 dockets and one of the aspects examined was: How many times was the BBFD Dog called out for rape cases? From the perusal of these 20 dockets, it transpired that the BBFD Dog had been called out in 2 of the 20 cases, and for these 2 cases there was also no proper record keeping on the use of the BBFD. This is an indication that BBFD Dog is grossly under-utilised at Booyens SAPS, despite the Provincial Instruction issued by the Provincial Commissioner that the BBFD Dog must be summoned to all murder and rape crime scenes.
- The participants in Sample A, B and C were asked to describe any experience they had had in the use of the BBFD Dog in their work environment. Of the Sample A participants, 11 had some experience; from Sample B, all 5 had experience since they are K9 handlers; from Sample C only 2 had some experience. This is an indication that the majority of the participants had some interaction with the BBFD Dog in their work environment.
- Participants were asked the question what contribution the BBFD Dog had made to them in the execution of their duties. Sample A, 17 participants gave very positive feedback, and only

3 were not sure; Sample B, all these participants provided positive feedback; Sample C, only 1 participant was not sure. In the responses, the majority of the participants indicated that the BBFD Dog could make a great contribution to the detectives' duties. Participants indicated that the dog would be very useful to detect minute evidence that is not visible to the naked eye, and could work in any kind of environment, especially in a larger crime scene.

- Participants were also asked to describe the advantages and disadvantages of using the BBFD Dog. The majority of the participants of Samples A, B and C indicated it would be a significant benefit to use the dog. No one indicated that there would be any disadvantage, except for 1 participant from Sample A and 1 from Sample C, who were not sure. According to the literature, many of the writers also agreed that police dogs could assist in many investigations and be used successfully for detection of numerous substances. However, no mention was made of the BBFD Dog by any of the authors, therefore the researcher attributes this to the fact that this type of dog is available only in SA.

4.2.2 Secondary findings

The secondary findings do not directly answer the main research questions, but are based on important aspects and derived from discussions in each chapter.

4.2.2.1 Secondary findings: Research question 1

- Osterburg and Ward (2010:75) state that DNA can be degraded or damaged, but with the introduction of more advanced DNA typing techniques such as PCR and STRS methods, even a minimum amount, as little as 1 ng is sufficient for a result in the lab. The various forensic labs around the world use different methods to analyse DNA samples, and the SAPS forensic lab uses the STRS method. If the BBFD Dog detects even a minimum amount of body-fluid evidence at a rape crime scene, the SAPS has the capacity and ability to analyse this evidence.
- Gardner (2012:7) defines evidence as anything that tends to prove or disprove a fact in contention, and in any investigation, the evidence presents itself as either testimonial or

physical. Fisher and Fisher (2012:67) state that detectives do not always possess a full range of specialised skills or experience to process all crime scenes. They therefore have to call in experts to assist with collection of evidence, for instance the detectives from FCS, the LCRC or forensic experts. However, the researcher noted during the docket analysis at Booyens SAPS that the experts were not being called out to the crime scenes.

- Butler (2012:7) states that the DNA database is of great value for tracing possible perpetrators in crimes such as rape, since many offenders of these violent crimes are repeat offenders. Countries like the UK and USA have very efficient DNA databases, which are employed for tracing rape perpetrators, since the DNA profiles of these suspects are recorded in the database once they are convicted. SA promulgated the new DNA Bill in January 2015, after much deliberation and pressure by the DNA project initiative (DNA Project, 2016:2).
- Individualisation could assist as a technique in rape cases, as highlighted by Bell (2008:210), Budhram and Van Graan (2015:65) and Houck and Siegel (2011:57). For this to happen, the detectives have to ensure thorough investigation of the crime scene, together with the crime scene experts to detect as much body-fluid evidence, collect, pack and send the body-fluid evidence from the rape scenes to the SAPS forensic labs. The submission of DNA evidence will also indicate whether a serial rapist is operating in the area.

4.2.2.2 Secondary findings: Research question 2

- Harel et al. (2015:1), state that the number of rape cases is increasing drastically, therefore the detection of sperm or semen, even if present in small quantities, is of paramount importance in the investigation of these cases. Harel et al. (2015:1), further state that the sperm and semen, no matter how old they are, could be detected at the crime scene by using very high-powered UV-VIS light sources and chemicals. The semen responds to illumination by longer-wavelength frequencies of UV light, which is invisible to the human eye. The light could make the invisible semen stains appear visible to the human eye, and chemical tests would confirm that they are indeed semen (Harel et al., 2015:2). The use

of these lights and chemicals, according to Gilbert (2007:292) and White (2007:382), is extremely costly, labour-intensive, and would require the detective to know which area to search. It would not be possible to search a large crime scene area by using specialised lights, according to Gilbert (2007:292), White (2007:382) and some of the Sample A and B participants, therefore, the BBFD Dog might be more effective for this purpose.

- The literature has definitively indicated the importance of having physical evidence to prove rape cases, since use of testimonial evidence alone will not ensure successful prosecution. The physical evidence is far more credible and can never lie.

4.3 RECOMMENDATIONS

Based on the findings of this research, the following recommendations are made regarding utilisation of the BBFD Dog as an aid in the investigation of rape:

4.3.1 Research question 1: What does criminal investigation entail?

- The detectives must have a proper understanding of the objectives of crime investigation in order for them to perform their duties effectively. It is recommended that the detectives receive training in detective courses such as ROC, Detective Commander Learning Programme (DCLP) and FCS Course for FCS members. The detectives should also receive refresher training, which would provide them with knowledge of all new laws and legislation (such as the new Sexual Offences Act, DNA Act, etc.). Experts from the National Prosecuting Authority (NPA) and private institutions, as well as university lecturers should also be invited to mentor the detective members from time to time, especially at the stations such as Booyens, which has a high crime rate of serious offences. The younger members have to be mentored by the more experienced members.
- It is recommended that detectives and uniform personnel also be sensitised as to the important role that forensic science plays in the criminal investigation process. They should know when to call out forensic experts to a crime scene. They would acquire this knowledge if they received frequent refresher training and workshops

during station lectures on the importance of evidence at a crime scene, and attended formal training in crime scene management, buccal sample training, and so forth. All new legislations should also be addressed at these forums (e.g. any new Acts such as the new DNA Act).

- It is recommended that the command structures at various level of management of the Booyens SAPS ensure that all reported rape cases are given the utmost attention as per SAPS National Instruction 3 of 2008. When rape case dockets are opened by the SAPS members, the detective or FCS unit should visit the crime scenes, where necessary. This includes instances where the complainant came by her-/himself to the police station to open the case, even a few days after the crime was committed. Command and control of these issues is of importance here, and the Duty Officer should ensure 100% compliance.

4.3.2 Research question 2: How is a biological body-fluid detection dog used during the gathering of DNA evidence in rape investigations?

- It is recommended that the SAPS market the BBFD Dog on a larger scale, and encourage its optimum utilisation at serious crime scenes. The internal SAPS communication channels could be useful for this purpose, e.g. the SAPS Servamus magazine and e-mails (by means of Forensic Fact Bulletins) could be used to highlight successes achieved by the BBFD Dog and K9 handler. Sample A participants had very good knowledge about the BBFD Dog, yet their use of the dog was minimal. Best practices and examples of where the dog had yielded successes should be shared, which would result in more optimal use of the BBFD Dog.
- The ability and purpose of the BBFD Dog should be made known to all detectives, especially in the rural areas. It is recommended that the SAPS Divisions Visible Policing and HRD train more BBFD Dogs and handlers in order to improve the current strength. The high-crime areas, such as Gauteng, should be prioritised and allocated the largest number of dogs and handlers.
- It is further recommended that proper training be given to the detectives to ensure that they gather sufficient physical evidence from the crime scene to secure a successful

conviction, or that they utilise experts from Forensic Services to gather the evidence. Sample B participants are trained by means of the DNA Evidence Recovery Course, to ensure that they understand how to identify, recover and collect DNA evidence.

- It is recommended that the Division HRD continue to roll-out training with regard to taking buccal samples to detectives countrywide. This process would help detectives to expand the DNA database in SA, which would result in identification of serial rapists or repeat offenders. It is also recommended that the detectives be encouraged to make use of this DNA database in their respective areas.
- It is recommended that the forensic experts and detectives who attend rape crime scenes be encouraged to make use of the BBFD Dog to detect body-fluid evidence, rather than using expensive UV lights and equipment.

4.4 CONCLUSION

This research is intended to determine the use of the BBFD Dog for the investigation of rape cases. The research was conducted to determine the objectives of crime investigation in respect of rape cases, and what value the BBFD Dog could add to the investigations. The researcher answered the research questions by means of the research design and methodology that were used. National and international literature was used, interviews were conducted with 3 sample groups (Sample A: 20 detectives; Sample B: 5 BBFD Dog K9 handlers; Sample C: 6 forensic analysts), and a docket analysis was done at the Booyens SAPS on rape dockets.

The investigation of rape requires not only excellent oral evidence from the victim or witnesses, but also the production of physical evidence in court to prove the case. This research showed that the lack of evidence in the cases of rape at Booyens SAPS resulted in few arrests and ultimately low numbers of convictions in court. This study has shown that the BBFD Dog could be extremely valuable to detectives when they conduct an investigation at the crime scene, specifically pertaining to the detection of body-fluid evidence such as blood or semen, which is crucial to link the suspect to the crime. The researcher therefore believes that if

the above recommendations were considered there would be a significant improvement in the investigation of rape cases at the Booyens SAPS, resulting in more arrests and conviction of suspects.

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6. ANNEXURES

6.1 ATTACHMENT A: INTERVIEW SCHEDULE

**INFORMED CONSENT: INTERVIEW SCHEDULE
RESEARCH STUDY - THE USE OF THE BIOLOGICAL BODY FLUID
DETECTION DOG FOR INVESTIGATION OF RAPE CASES**

RESEARCHER – V MAHARAJ

UNISA

Dear Participant, kindly take note of the declaration below.

I hereby give permission to be interviewed for above study and the information given by me in the interview schedule can be used for the study.

Please select an option below and mark with X

YES	
NO	

Participants Name: _____ **(Optional)**

Participants Signature: _____ **(Optional)**

Date: _____

INTERVIEW SCHEDULE

MASTERS STUDY – V MAHARAJ (2016)

UNISA

THE USE OF THE BIOLOGICAL BODY FLUID
DETECTION DOG FOR INVESTIGATION
OF RAPE CASES

Name of Participant: _____

Unit /Station: _____

Position: _____

Contact Number: _____

Signature: _____

Place: _____

Dear participant thank you for your participation in this interview. Please note that the researcher has undertaken to keep all information strictly confidential and for sole purpose of this study, and that all guidelines, ethical issues and rules pertaining to interviews have been complied with.

1. Briefly describe your understanding of the objectives of Crime Investigation.

2. Based on your experience what is your understanding of the crime of Rape?

3. What is your understanding of DNA evidence?

4. What is your understanding of analysis of DNA evidence?

5. What is your understanding of the Biological Body Fluid Detection Dog?

6. In your experience can you describe how the Biological Body Fluid Detection Dog is used?

7. Describe any experience you had with the use of the Biological Body Fluid Detection Dog in your work environment.

8. Do you know how the Biological Body Fluid Detection Dog is utilised for the gathering of evidence on rape crime scenes?

9. What contribution can the Biological Body Fluid Detection Dog add for you in the execution of your duties pertaining to rape cases?

10. When using the Biological Body Fluid Detection Dog on a rape scene, state the advantages (if any) for such use.

11. If the Biological Dog was not used, was there any disadvantage of not using the dog on the crime scene?

END THANK YOU

6.2 ANNEXURE A: APPROVAL TO CONDUCT RESEARCH IN THE SAPS DIVISION FORENSIC SERVICES



Private Bag X322 Fax No: 012 421-0410

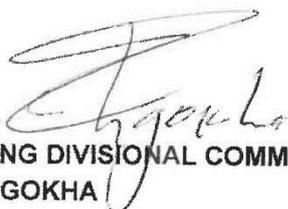
Your reference: 3/34/2 THE DIVISIONAL COMMISSIONER
My reference: FORENSIC SERVICES
Enquiries: Lt Col HMR Mampane PRETORIA
0001
Tel: (012) 421-0440

The Head
STRATEGIC MANAGEMENT

RE: RESEARCH PROPOSAL: THE USE OF THE BIOLOGICAL BODY FLUID DETECTION DOG FOR INVESTIGATION OF RAPE CASES: MASTERS DEGREE: UNIVERSITY OF SOUTH AFRICA: RESEARCHER: V MAHARAJ

1. Your communiqué with reference 3/34/2 dated 29 March 2016 bears reference.
2. Approval is hereby granted to the above-mentioned request, provided that the applicable directives on conducting research are adhered to.

Kind Regards


**MAJOR GENERAL
ACTING DIVISIONAL COMMISSIONER: FORENSIC SERVICES
EK NGOKHA**

DATE: 2016-04-18

6.3 ANNEXURE B: APPROVAL TO CONDUCT RESEARCH IN THE SAPS DIVISION VISIBLE POLICING

G.P.S 002-0222

SAPS 21

SUID-AFRIKAANSEPOLISIEDIENS



SOUTH AFRICAN POLICE SERVICE

Private Bag	X540, PRETORIA, 0001
Verwysing	: 3/34/2
Reference	: Lt Gen Masiye Lt Col Moolman
Navree	: Lt Gen Masiye Lt Col Moolman
Enquiries	: Lt Gen Masiye Lt Col Moolman
Telefoon	: 012 421 8476
Telephone	: 012 421 8476
Epos	: moolmanj@saps.gov.za
E-mail	: moolmanj@saps.gov.za

**DIVISIONAL COMMISSIONER
VISIBLE POLICING
HEAD OFFICE**

The Divisional Commissioner (Attention: Lt Col Joubert)
RESEARCH

APPLICATION TO CONDUCT RESEARCH: V MAHARAJ: THE USE OF THE BIOLOGICAL BODY FLUID DETECTION DOGS FOR INVESTIGATING OF RAPE CASES

1. Your letter dated 2016-06-20 under reference 3/34/2 (*Annexure A*) regarding the above refers.
2. Paragraph 2 of the above letter requests the Divisional Commissioner: Visible Policing to grant permission for the interviewing of dog handlers from Gauteng, North West and Mpumalanga Provinces by the researcher.
3. According to paragraphs 3 and 4 of the above letter the Division: Research has perused the research proposal and found it to be compliant with National Instruction 1 of 2000: Research. It further states that the Division Research will monitor compliance by the researcher in terms of the research conditions.
4. The Divisional Commissioner: Visible Policing agrees with the terms of the research as stated in paragraph 7 and further request that:
 - A copy of the annotated research work be submitted to the Divisional Commissioner on completion (email to moolmanj@saps.gov.za);
 - the researcher present his findings to the Divisional Commissioner: Visible Policing and the Section Head: K9 and Mounted Services; and
 - the interviews are concluded by no later than 2016-11-30.
5. If the above conditions are adhere to, the Divisional Commissioner: Visible Policing has no objection against the Division Research granting permission for the research to be conducted.

APPLICATION TO CONDUCT RESEARCH: V MAHARAJ: THE USE OF THE
BIOLOGICAL BODY FLUID DETECTION DOGS FOR INVESTIGATING OF RAPE
CASES

6. The following members of the Division Visible Policing can be contacted for assistance during the research:

Divisional Research Centre

Lt Colonel J Moolman
012 421 8476
moolmanj@saps.gov.za

Section Head: K9 and Mounted Services

Brigadier MG Govender
012 421 8352
govendermg@saps.gov.za



LIEUTENANT GENERAL
DIVISIONAL COMMISSIONER: VISIBLE POLICING
NP MASIYE

Date: 2016/07/21

6.4 ANNEXURE C: APPROVAL TO CONDUCT RESEARCH IN THE SAPS GAUTENG PROVINCE



PERMISSION TO CONDUCT RESEARCH IN THE SAPS

RESEARCH TOPIC: THE USE OF THE BIOLOGICAL BODY FLUID DETECTION DOG FOR INVESTIGATION OF RAPE CASES

RESEARCHER: COL V MAHARAJ

Permission is hereby granted to the researcher above to conduct research in the SAPS based on the conditions of National Instruction 1 of 2006 (as handed to the researcher) and within the limitations as set out below and in the approved research proposal.

This permission must be accompanied with the signed Indemnity, Undertaking & Declaration and presented to the commander present when the researcher is conducting research.

This permission is valid for a period of Twelve (12) months after signing.

Any enquiries with regard to this permission must be directed to Lt. Col. Peters or SAC Linda Ladzani at PetersNS@saps.gov.za / Ladzanim@saps.org.za.

RESEARCH LIMITATIONS / BOUNDARIES:

Research Instruments:	Interviews (Semi-structured) Statistical survey
Target audience / subjects:	Johannesburg Cluster – Booyens SAPS Forensic Analyst Biological K9 handlers
Geographical target:	Gauteng
Access to official documents:	Yes Training manuals Closed case dockets Crime Stats Literature


LT. GENERAL
PROVINCIAL COMMISSIONER: GAUTENG
DS DE LANGE

03 MAY 2016

Page 5 of 5

6.5 ANNEXURE D: PERMISSION TO CONDUCT RESEARCH IN THE SAPS NORTH WEST PROVINCE

SUID-AFRIKAANSE POLISIEDIENS



SOUTH AFRICAN POLICE SERVICE

Private Bag
Privaatsak X 801

Reference number:	3/34/2
Enquiries:	Col Mapolesa Lt. Colonel Motosiwa
Telephone number:	018 - 299 7706 / 7076
Fax number:	018 - 299 7090

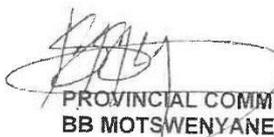
THE OFFICE OF THE PROVINCIAL
COMMISSIONER
NORTH WEST PROVINCE
POTCHEFSTROOM
2520

Lt. Col. V Maharaj
Human Resource Development
PRETORIA
0001

RE – RESEARCH REQUEST: THE USE OF BIOLOGICAL BODY FLUIDS DETECTION DOG FOR INVESTIGATION OF RAPE CASES: NORTH WEST

1. Herewith be informed that your request to conduct a research on the above-mention topic has been approved in terms of National Instruction 1 of 2006 with the following conditions:
 - 1.1. The research be conducted at no cost to the state,
 - 1.2. Service Delivery may not be hampered at any stage during the research,
 - 1.3. No official transport and other state resources may be used for the duration of the research,
 - 1.4. All conditions as prescribed within the National Instruction 1/2006 paragraph 6 must be complied with, and
 - 1.5. Attached please find copies of National Instruction 1/2006 together with the request for access to records of the South African Police Service for your perusal and compliance.

Regards


LIEUTENANT GENERAL
PROVINCIAL COMMISSIONER: NORTH WEST
BB MOTSWENYANE

Date: 2016-04-14

**6.6 ANNEXURE E: PERMISSION TO CONDUCT RESEARCH IN THE SAPS
MPUMALANGA**

SUID-AFRIKAANSE POLISIEDIENS



SOUTH AFRICAN POLICE SERVICE

SAP 21

Privaatsak /Private Bag X 11299, NELSPRUIT 1200

Verwysing Reference	3/34/2
Navrae Enquiries	Lt Gen Zuma Colonel Griffiths
Telefoon Telephone	013 762 4676
Faksnommer Fax number	013 762 4684

THE PROVINCIAL COMMISSIONER
MPUMALANGA
1200

The Head
Strategy, Research, Monitoring and Evaluation
National Head Office
PRETORIA
0001

Re: RESEARCH PROPOSAL: THE USE OF THE BIOLOGICAL BODY FLUID DOG FOR THE INVESTIGATION OF RAPE CASES: MASTERS DEGREE: UNIVERSITY OF SOUTH AFRICA: RESEARCHER: V MAHARAJ

1. Your letter 3/34/2 dated 2016-02-24 refers.
2. Permission is hereby granted for the research to be conducted in Mpumalanga.

RECOMMENDED:

It is recommended that the research may be conducted in Mpumalanga.

[Signature]
LIEUTENANT COLONEL
PROVINCIAL COMMANDER: POLICE EMERGENCY SERVICES
MPUMALANGA
P BESTER

Date: 2016-05-11

APPROVED:

[Signature]
LIEUTENANT GENERAL
PROVINCIAL COMMISSIONER: MPUMALANGA
B M ZUMA

Date: 2016-05-16

6.7 ANNEXURE F: UNISA ETHICS APPROVAL



COLLEGE OF LAW RESEARCH ETHICS REVIEW COMMITTEE

Date: 2016/06/03

Reference: ST 69
Applicant: V. Maharaj

Dear V. Maharaj
(Supervisor: Dr. J.S.Horne)

DECISION: ETHICS APPROVAL

Name	V. Maharaj
Proposal	An evaluation of the use of biological body fluid detection dog for investigation of rape cases
Qualification	MA Criminal Justice

Thank you for the application for research ethics clearance by the College of Law Research Ethics Review Committee for the above mentioned research. **Final approval is granted.**

The application was reviewed in compliance with the Unisa Policy on Research Ethics.

The proposed research may now commence with the proviso that:

- 1. The researcher will ensure that the research project adheres to the values and principles expressed in the Unisa Policy on Research Ethics which can be found at the following website:*

http://www.unisa.ac.za/cmsys/staff/contents/departments/res_policies/docs/Policy_Research%20Ethics_rev%20app%20Council_22.06.2012.pdf

- 2. Any adverse circumstances arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the College of Law Ethical Review Committee.*



Open Rubric

University of South Africa
Pretorius Street, Muckleneuk Ridge, City of Tshwane
PO Box 392, Unisa, 0003, South Africa
UNISA/UNISA 2016/06/03

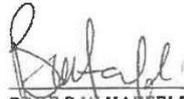
An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants

- 3. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.*

Note:

The reference number (top right corner of this communique) should be clearly indicated on all forms of communication (e.g. Webmail, E-mail messages, letters) with the intended research participants, as well as with the URERC.

Kind regards



PROF B W HAFELE
CHAIR PERSON: RESEARCH ETHICS
REVIEW COMMITTEE
COLLEGE OF LAW



PROF R SONGCA
EXECUTIVE DEAN:
COLLEGE OF LAW

6.8 ANNEXURE G: REPORT TURNITIN

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