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forensic DNA consultants PTY LTD

SUBMISSION: CRIMINAL LAW (FORENSIC PROCEDURES) AMENDMENT BILL

This document is a written public submission to the Ad hoc Committee on Criminal Law on the draft Criminal Law (Forensic Procedures) Amendment Bill by a private company with expertise in the Forensic DNA environment i.e. Forensic DNA Consultants (Pty) Ltd

EXECUTIVE SUMMARY

1. *Final Conclusions on suggested Amendments contained in the Criminal Law (Forensic Procedures) Amendment Bill*:

   FDC (Pty) Ltd as private sector company with significant expertise on the subject of forensic DNA in South Africa - is of the opinion that the intended amendments to the existing legislative structure have been:

   a. Very well researched,
   b. Are in line with international requirements for the utilization of forensic DNA databases,
   c. Will add significant value to the use of forensic DNA in the investigation and even the prevention of crime in South Africa; and most importantly that
   d. It is structured in such a way that the constitutional rights of the individual are sufficiently protected.

2. *Purpose of this submission:* FDC (Pty) Ltd as a company hopes that it can through this document provide additional information and a framework that may assists the SAPS and especially the OCJSR with their very worthwhile efforts to implement Change Six of the CJS Seven-Point-Plan in order to reform the criminal justice system.

3. *Purpose of this document:* In this document, FDC (Pty) Ltd attempts to provide a generic overview of some of the facets of forensic DNA investigations in South Africa which is relevant to these amendments, as well as to address some of the potential public fears that may be engendered as these amendments are tabled and being discussed.

4. Discussion point 1: *Possible misuse or abuse of the information in the NDDSA:*

   1.1. *Outsourcing of services for the expansion of the National DNA Database of South Africa (NDDSA):*

   *O*utsourcing does not pose a threat to the credibility or integrity of future NDDSA operations provided that:

   i) *Services are limited* to the generation of DNA profiles from *suspects or convicted offender samples only*. This leaves the responsibility for reporting any criminal investigative intelligence (forensic DNA results) to the SAPS FSL, and not with independent parties.
   ii) *Verification of a DNA profile match* by the SAPS FSL with a newly obtained blood sample is required to show procedural or laboratory error.
   iii) The *formation of a watchdog or monitoring committee* to protect public interest and constitutional rights is suggested, while
   iv) SAPS FSL should have *stringent procedures and quality control measures* in place to monitor outsourcing laboratories at the technological and DNA result levels. At the same time it needs to be remembered that
   v) The *intrinsic scientific and forensic value of a DNA profile is limited* if not used in conjunction with the other profiles in the investigation, which only SAPS FSL as custodian of the NDDSA will have access to.

   1.2. *Understanding the forensic DNA process as it is operated in South Africa by the South African Police Services:*

   In South Africa the criminal investigative process for forensic DNA typing consists of the following main events in sequence (These are discussed in more detail in the main document):

   i) Reporting of the crime to the SAPS
   ii) Collection of forensic evidence
   iii) Sending of forensic evidence to the SAPS FSL laboratories
   iv) Initial testing for body fluids i.e. presumptive testing

v) DNA testing in order to generate DNA profiles consisting of the following main sub processes:
   (1) The *Extraction* process
   (2) The *Quantification* process
   (3) The *Amplification* process
   (4) The *Separation* process
   (5) The *Analysis* process
vi) Quality control of DNA profiles and uploading to NDDSA
vii) Reporting of results to criminal courts and to SAPS investigators i.e. inclusion of suspect; exclusion of suspect and inconclusive results
viii) NDDSA Hit administration in order to link different cases with one another for purposes of criminal intelligence. The classification system for so-called "hits" between different DNA profiles within a case; or between DNA profiles in different cases are discussed here.
ix) Verification of DNA profile information linking cases, or suspects with seemingly non related cases and reporting of this criminal intelligence to the relevant parties for investigation.

5. Discussion Point 2: *Risks of contamination by other evidence samples; police members or the laboratory environment.* Several preventative measures are discussed in this section of the document which provides some information on how this issue can be addressed from a practical perspective. This section concludes that there are sufficient measures already in place in this regard to provide future confidence in the integrity of the data contained and integrated by the SAPS FSL in the NDDSA.

6. Discussion Point 3: Insertion of Section 36B in Chapter 3 of Act 51 of the Criminal Procedure Act of 1977: *What if the non intimate samples collected by the police officer are somehow handled incorrectly?*
Two possible scenarios are discussed in more detail in this section indicating that corrective steps are possible. This section serves to illustrate that even though errors can occur during collection of non-intimate samples, there are quality control measures which can be used to identify and correct for these errors.

7. Discussion Point 4: *What is the possibility that a police official could physically harm a person when taking non intimate samples in terms of Section 36; violate their constitutional rights or that this mandate to take samples could become a form of victimization and abuse in the hands of the SAPS?*

   This section re-visits the possibilities of abuse of the NDDSA from another perspective i.e. that of the individual. This is probably the most controversial aspect of the new amendments to the Criminal Procedure Act. It is suggested amongst others that the following should be considered seriously by the SAPS:

   i) That the collection of non intimate samples should preferably be *limited to police officers trained specifically* for the purpose of taking non-intimate samples, and under strictly controlled conditions. Having dedicated personnel who perform this function should limit abuse of the situation by the average police official and engender trust in this process with the general public.
   ii) Non intimate samples *should initially only be taken for specific offences to prevent an overload and eventual backlog of sample processing.*

8. Discussion Point 5: *Abuse of the Genetic Privacy of the individual; The concept of Genetic Discrimination*

   The average member of the public may be worried about what their DNA profile could reveal if it resides in a forensic DNA database. Ironically speaking this is probably the one type of DNA database which is least likely to reveal any genetic "secrets" due to the type of DNA sequences that are used. This section provides some more information in this regard.

Abbreviations

SAPS	South African Police Service
SAPS FSL	South African Police Service Forensic Science Laboratory (Biology unit)
FDC	Forensic DNA Consultants (Pty) Ltd – the source of this document
GSPS	Genetic Sample Processing System – the unique SAPS FSL fully automated forensic DNA laboratory
NDDSA	National DNA Database of South Africa – the central repository of DNA profiles situated with the SAPS FSL
OCJSR	Office for Criminal Justice System Reform

Introduction

Forensic DNA Consultants (Pty) Ltd as a privately owned company welcomes the opportunity to make a submission in respect of the draft Criminal Law (Forensic Procedures) Amendment Bill.

As a company currently involved in assisting the South African Police Service Forensic Science Laboratory to provide better forensic DNA services to the public, it was seen as important that Forensic DNA Consultants (Pty) Ltd as an entity with relevant forensic DNA expertise, come forward to support legislation which has been long overdue, and which can significantly assist in improving the lives of many South Africans who are the victims of crime.

Forensic DNA Consultants (Pty) Ltd, hereafter referred to as FDC – was started by Arnold Greyling, former Technical manager of the Biology unit of the South African Police Service Forensic Science Laboratory (SAPS FSL) for a time period of about 11 years. During his time as technical manager the SAPS FSL implemented a lot of state of the art technologies to perform DNA testing, culminating in the operational implementation of the world's first and only fully automated robotic forensic DNA laboratory – the Genetic Sample Processing System or GSPS. He currently provides technical and operational support for this system to the SAPS FSL under contract. He has also been personally *responsible for developing a lot of the forensic DNA laboratory infrastructure, standard operating procedures, casework policies and technologies currently used by the SAPS FSL to investigate DNA crime samples today*. In his capacity as the first custodian of the DNA Criminal Intelligence Database that was later to become the NDDSA (National DNA Database of South Africa), he was responsible for *developing the initial operational NDDSA framework, work procedures and DNA profile hit administration protocols which are being used to link suspects to cases, and cases to related cases.*

Due to this technical expertise FDC is therefore in a unique position to clarify certain issues which the general public may have as these amendments are tabled.

Technological Context

The South African situation with regard to the use of forensic DNA for criminal investigation is an anathema.

Even though the South African Police Service Forensic Science Laboratory (SAPS FSL) is the envy of many forensic DNA laboratories internationally due to its technologically advanced instrumentation e.g. the automated Genetic Sample Processing System (GSPS); the DNA profiles generated by means of this technology as well as its utilization is significantly inhibited by a lack of legislation which could allow for forensic DNA to become a more valuable criminal investigative tool. The current situation is very much one of having a vehicle without wheels – you can sit in it, but not use it for what it was originally intended, which is to travel to a destination.

The suggested amendments will be the equivalent of putting wheels onto the vehicle – by allowing for the proper legislative structure, the Department of Safety and Security; the Department of Justice; Correctional Services and the general South African public will have proper access to one of the most significant crime investigation tools that the 21st century has to offer.

FDC (Pty) Ltd as a private sector company with significant expertise on the subject of forensic DNA in South Africa - is of the opinion that the intended amendments to the existing legislative structure :

1) *have been very well researched,*
2) *are in line with international requirements for the utilization of forensic DNA databases,*
3) *will add significant value to the use of forensic DNA in the investigation and even the prevention of crime in South Africa; and most importantly that*
4) *It is structured in such a way that the constitutional rights of the individual are sufficiently protected.*

This unique and quite elegant legislative South African solution is possible due to the combined use of the Police Service Act which regulates the operations of the DNA database within the SAPS environment, as well as the necessary amendments to the original Criminal Procedure Act which pre-dates the international use of forensic DNA by approximately 10 years. At the same time the new Forensic Procedures Amendments Bill now being discussed post-dates the implementation of DNA by SAPS FSL by almost 18 years; and is therefore very long overdue for these changes to be made.

If this document serves only to provide a better understanding of how forensic DNA is currently being applied to criminal investigations in South Africa, it will have served its purpose. Instead – FDC as a company hopes that it can provide the necessary information and structure that may assists the SAPS and especially the OCJSR with their very worthwhile efforts to implement Change Six of the CJS Seven-Point-Plan in order to reform the criminal justice system.

In the rest of this document, FDC would like to provide a generic overview of some of the facets of forensic DNA investigations in South Africa which is relevant to these amendments, as well as to address many of the potential public fears of abuse and/ or lack of existing structures, protocols, checks and balances - that may be engendered as these amendments are tabled and discussed.

Specific Comments

Questions related to Public fears of a Forensic DNA Database

1. *Misuse or Abuse of Information contained in the NDDSA (National DNA Database of South Africa)*

The lay person and even some scientists not familiar with the forensic DNA environment may have fears that information contained in such a database may be used in some way to victimize innocent individuals or wrongly associate them with a crime. The constitutional rights of the individual are frequently quoted in this regard.

1.1 . Outsourcing for the expansion of the NDDSA

The first and most important fact that needs to be addressed is the unnecessary *fear that control of the NDDSA and the information contained within will be readily available to parties other than the SAPS FSL, and for purposes other than the investigation of crime by the SAPS.*

Part of this discomfort stems from the possible *outsourcing* by the SAPS FSL of the capacity required to add DNA profiles to the NDDSA repository. The question is very much – *what will happen if government and legislation allows for the outsourcing of forensic DNA typing to the private sector, and how this can be done without losing control of sensitive information contained in the NDDSA?*

It is important to understand that the NDDSA and its DNA profile content is protected from misuse at several very practical and scientific levels in addition to the legislative restrictions included in the amendments. Obviously there are requirements that the NDDSA repository and the utilization of the DNA profiles to link suspects with cases or cases with one another – should reside exclusively with the South African Police Service and in particular with the SAPS FSL. Beyond this crucial requirement, there are many other checks and balances that are already in existence and even more that can be implemented. Some of these checks and balances are mentioned below:

a) *Limitation on the type of services rendered*: Outsourcing does not pose a threat to the credibility or integrity of future NDDSA operations provided that *services* thus provided are *limited to the generation of DNA profiles from suspects or convicted offender samples only*. No crime evidence collected at crime scenes or obtained from victims may be typed by these parties. This limitation in terms of the type of sample which is outsourced for DNA typing will leave the NDDSA as the only repository where SAPS FSL evidence related DNA profiles can be linked or matched to a specific individual. It also leaves the responsibility for reporting any criminal investigative intelligence (forensic DNA results) to the SAPS and criminal courts, with the SAPS FSL, and not with independent parties.

b) *Verification* of a DNA profile match by the SAPS FSL with a newly obtained blood sample (specifically as an intimate sample and therefore obtained by a qualified medical practitioner),

will clearly indicate any inconsistencies in DNA profiles provided by the relevant outsourcing laboratory to the NDDSA, and allow for confidence that the constitutional rights of the individual has been taken into account. This process is about transparency and providing the individual with information about any investigations involving them as a person.

c) *Prescribed procedures and Quality control*: Strict technical auditing, accreditation and prescriptions on work procedures by the SAPS FSL either as the sole accrediting body or in conjunction with the South African National Accreditation System (SANAS), should ensure that independent outsourcing laboratories meet the stringent criteria of the forensic DNA environment.

d) The formation of a *watchdog or monitoring committee* consisting of experts from different fields will ensure that public interests are protected if outsourcing becomes a reality in future. The mandate of such an entity would be to monitor the NDDSA and the activities of the outsourcing laboratories to ensure proper standards of ethical practices are adhered to, and to ensure that individual rights to genetic privacy as implied in the constitution is protected at all times.

e) The *intrinsic value of a DNA profile*: At scientific level the DNA profiles generated by such a party will have no intrinsic value, unless it is used in conjunction with other DNA profiles on the NDDSA repository. Only the SAPS FSL as custodian of the NDDSA will be able to access both types of DNA profiles once uploaded by the respective parties i.e. the outsourcing laboratory and the SAPS FSL. Forensic markers used by these parties will have to meet SAPS FSL and international requirements, of which the most important is that these markers do not provide any information regarding an individual's physical characteristics or genetic predispositions to any pathological or health related characteristics.

   A forensic DNA profile has no inherent value in itself when not related to the other evidence profiles, nor does it have any uses apart from the identification of an individual. This is due to the fact that, since the inception of forensic DNA as investigative tool, the forensic DNA community has been very particular about using the DNA which forms part of the individuals' genetic makeup that has no other application or value but to distinguish one individual from another. As a matter of fact – the DNA of forensic interest is frequently called "junk DNA" by geneticists, since the scientific community has not been able to find any other usefulness for it but to uniquely identify an individual.

1.2. Understanding the forensic DNA process
– What happens to the samples and evidence once it has been collected by the SAPS?

Public fears about the science and processes involved in forensic DNA testing can be addressed to a large extent by explaining what the *full sequence of events are up to the level of generating a DNA profile and storing it on the NDDSA*; *what information usually is kept in the database*, *how the forensic laboratory use that information for the purposes of criminal investigation* and *how a suspect is linked or excluded by means of forensic DNA evidence*.

In South Africa the criminal investigative process for forensic DNA typing consists of the following sequence of events:

- A criminal case is reported and the SAPS will assign a reference number, called a CAS number, which is unique to a police station and becomes the first level reference for all subsequent investigations performed by SAPS.

- SAPS personnel will collect possible sources of biological evidence at the scene of a crime and a reference (control) blood sample from any likely suspect/s, and package it in crime kits developed specifically by the forensic DNA laboratory for the storage and transport of biological evidence. These forensic crime kits:

    - Seals and prevents tampering with evidence
    - Prevents biological degradation and contamination of evidence

- The crime kits (indicating the Police station and CAS reference number) are sent to the SAPS FSL where it enters the operational casework processes based on the SAPS crime prioritization policies.

- The SAPS assigns a Laboratory number to be used as reference for all forensic examinations performed within the laboratory environment. This Laboratory number in turn references to the original CAS number mentioned above.

- The crime kits are opened and certain initial tests (called presumptive tests) may be performed on the evidence contained therein; for example – in a rape case, a so-called presumptive test will be performed to indicate the presence of semen on swabs obtained from the rape victim during a medical examination performed after the incident. These tests show the presence of certain body fluids e.g. semen, and since these do not directly assist in identification of the suspects, are called *presumptive*. The presence of semen in a rape case has definite value as it supports the fact that penetration/ejaculation had taken place and the process of further identification of the suspect/s by means of DNA typing of the seminal

fluid is possible. In many instances the mere reporting of the presence of seminal fluid in a rape case by the SAPS FSL is sufficient to assist the court to finalize a case.

- If further DNA typing is required in a case, the evidence samples will now enter the different DNA processes within the SAPS FSL environment in order to generate DNA profiles.

- IMPORTANT: *From this point onwards the evidence samples and reference blood samples of the suspects become anonymous.* All samples entering the DNA laboratory processes are allocated with a unique barcode and categorized based on the type of sample. *SAPS FSL personnel involved in the DNA typing process and analysis of the results therefore do not have direct access to case related information e.g. the name or circumstances of the case. This approach ensures objectivity and eliminates bias in generating the DNA profiles and determining the quality standard of the final DNA profile.* For the categorization of samples entering this process the SAPS FSL makes use of so-called indexes to categorize samples for further processing, of which the two most crucial indices are the :
    - Reference index – which consists of samples of suspects and victims of crime
    - Crime index – which consists of all crime scene evidence or related biological evidence collected from various sources related to the crime e.g. clothing obtained from the suspect or victim, trace evidence collected from the scene of the crime or other related locations

- The main process of generating a DNA profile from the samples consists of the following sub processes:
    - The *Extraction* process – DNA is isolated and collected from the sample by means of a chemical process
    - The *Quantification* process – the amount of DNA which could be isolated from the sample is determined. A further advantage from this process is to determine the presence of male DNA in rape or sexual assault cases. This test is far more conclusive than the initial presumptive test performed initially by the SAPS FSL
    - The *Amplification* process – which uses a chemical process to target and amplify the specific regions of the DNA of forensic interest. This is called the Polymerase Chain Reaction, or PCR process.
    - The *Separation* process – where DNA product from the amplification process is put through instrumentation which generates the final DNA profile, also called an STR or Short Tandem Repeat profile
    - The *Analysis* process – where specially trained personnel evaluate the DNA profiles for quality purposes on the basis of specific criteria, and subsequently load these DNA profiles to the NDDSA casework repository.

- Once the DNA profile has been added to the casework database, the *DNA profile is searched against the whole database of profiles* for any which match it either exactly or in part. This

search for matching profiles includes the DNA profiles of all individuals who may have come into contact directly or indirectly with evidence within the SAPS FSL environment. I.e. all laboratory personnel.

Important: A very crucial limitation of the NDDSA needs to be mentioned here. If samples e.g. non intimate samples are to be collected directly by police officers for forensic DNA typing, the current personnel database need to be expanded beyond the SAPS FSL personnel to include all members of SAPS that may come into contact with criminal evidence. This practice is followed in many countries operating national DNA databases, but is not currently followed in South Africa.

- A forensic analyst called a Reporting officer will subsequently draw reports from the operational casework database (in principle the NDDSA) for a specific case and in conjunction with the case information provided by the SAPS investigator, attempt to reach one of three *possible conclusions* based on the DNA profiles of the particular case. These are:
    - *Inclusion* – this is where matching DNA profiles are generated from different evidence samples in the case, for example the DNA profile generated from a suspect blood sample could match the DNA profile from a sample collected at a crime scene, thus by implication placing the suspect at the scene of a crime
    - *Exclusion* – this is when the suspect blood sample typed by the laboratory does not match the DNA profiles found on other evidence samples in the case. Important: this does not necessarily imply the innocence of the suspect, but merely that no DNA matching the suspects DNA profile could be found on the other evidence in the case, for example – in a rape case the suspect may have used a condom, therefore not leaving any DNA on the samples obtained from the victim
    - *Inconclusive* - this statement will be made by the reporting officer in instances where a definite inclusion or exclusion statement is not possible. These usually occur in rape cases where mixtures of DNA profiles can be found on the sample obtained from the victim, and the mixture of DNA profiles make it impossible to clearly determine the possible sources of the profiles.

The final conclusions with regard to the DNA profile matches are then incorporated into an affidavit or other forms of written communications and provided to the SAPS investigative officer of the particular case and/or to the criminal courts. Subsequently the reporting officer may be subpoenaed to testify in court regarding the results provided in the report.

- Apart from the general casework process mentioned above, the DNA profiles loaded to the NDDSA are examined in further detail by forensic DNA experts in order to gain additional criminal intelligence information. This process is called Hit Administration, since the term "hit" is used to describe a match between two DNA profiles in the database.

These hits are classified at two main levels – the first being the so-called "*intra-case*" hit were the suspect/s are linked to the particular case for which the blood samples were

originally collected and the "*inter-case*" hits, where DNA profiles from different cases are linked with one another. These "*inter-case*" hits can in turn be classified in the following categories:

- *Reference index* to *Reference index* hits – these describe matches between two DNA profiles originating from blood samples obtained from the same individual. This scenario can happen when a suspect or victim profile is loaded to the database multiple times. This information may indicate that a particular individual feature frequently in criminal investigations.

- *Crime index* to *Crime index* hits - these describe matches between DNA profiles originating from evidence samples obtained from different crime scenes in different investigations, or any other evidence which may link a suspect in a criminal investigation. This information is very useful for linking cases with one another when a suspect has not been identified as yet. Linking these cases with one another in this fashion indicates that the same suspect/s is involved and that the crimes are serial in nature. At the same time the knowledge that these cases are related provide the investigating officers with additional investigative leads in order to identify the perpetrator/s.

- *Crime index* to *Reference index* hits - these describe matches between DNA profiles originating from both suspect blood samples and crime scene evidence. This information is very useful since it identifies suspects not only within the particular case for which a blood samples was originally provided, but it also allows for linking these suspects to other possible cases were they were involved.

  This particular type of hit can therefore solve a crime in an instant. This generation of these very useful types of hits can be significantly increased by expanding the number of suspect and convicted offender profiles on the NDDSA, and that is why the expansion of the NDDSA is of such importance. These is where most international forensic DNA databases has significant success in identifying suspects in criminal investigations, the only requirement being that as many suspect arrestees or convicted offender samples as possible need to added to the national DNA profile repositories.

- After the hits of the NDDSA has been identified, classified and confirmed as valid matches, this information is passed along to the relevant investigative officers and a *verification process* starts. The verification process requires that a new blood sample, preferably an intimate sample collected by a medical professional, is obtained from the suspect in question, re-typed by the SAPS FSL, added to the NDDSA, and the hit confirmed a second time. This not only *eliminates the possibility of laboratory error* during the generation of the

first DNA profile, but also forces the SAPS to inform the suspect that he/she is being investigated in other crimes.

2. *Risks of contamination by other evidence samples ; police members or the laboratory environment*

There are a lot of preventative measures at different places during the process of collecting and forensically testing the evidence samples. The following will give some indication of measures which are already being used on a daily basis by the South African Police Services:

- Evidence is collected at crime scenes by using specific procedures which take possible contamination by crime scene examiners or members of the public into account, for example – the use of gloves and other protective clothing; the preservation of the integrity of a crime scene; special personnel trained in crime scene examination techniques are used and many more such measures

- Evidence collected is marked; photographed and packaged in accordance with *specific guidelines* provided by the SAPS FSL before being sent to the laboratory. If these criteria for packaging are not met and the possibility of contamination compromises the integrity of the evidence, the Forensic Science Laboratory <u>will not</u> examine the evidence samples whatsoever. The most critical requirement of the packaging is that the reference blood samples collected from possible suspects may not be packaged with the actual evidence samples, must be packaged separately, and sealed and marked clearly. In most instances the suspect samples are not sent to the laboratory at the same time as the crime scene evidence.

  Within the SAPS FSL *laboratory environment* there are a multitude of measures to prevent contamination of which the following are just some of the more prominent: Reference samples are typed for DNA profiles separately from evidence samples from the crime scenes in separate laboratory processes

  - Samples in many instances are re-typed to confirm the consistency of results before reporting the results to the investigative officers and the court
  - Strict quality control measures to verify the correctness of information reported to the investigative officers and the court
  - Controls are used during these processes that will indicate the presence of contaminants in the laboratory environment
  - Each DNA profile generated in a case is searched against a personnel elimination database to verify that laboratory personnel did not contaminate the profile.
  - Standard procedures for the prevention of contamination is used in the laboratory for example using only sterile and disposable consumables per sample, decontamination procedures for work surfaces and instrumentation; protective clothing and a lot of other preventative measures

- Whenever the sample allows for it – the SAPS FSL retains part of the original sample as received. This will allow for re-testing of the sample either by the SAPS FSL or an independent laboratory if there is doubt about the handling of the evidence within the SAPS FSL environment. This has been done on many occasions in the past and to date, no independent laboratory testing have come up with other DNA profiles than those generated by the SAPS FSL. This is also most likely due to the fact that the SAPS FSL has some of the strictest criteria for the reporting of DNA profiles anywhere in the world.

3. *Insertion of Section 36B in Chapter 3 of Act 51 of the Criminal Procedure Act of 1977: What if the non intimate samples collected by the police officer is somehow handled incorrectly ?*

   Different scenarios are possible, many if not all of these scenarios can once again be addressed by means of certain *procedural checks and balances*, some which are already standard practice with the SAPS FSL for DNA evidence, while others will have to be introduced. Two of the most likely scenarios are as follows:

   - *Scenario 1 - the non-intimate sample collected by the police officer is somehow switched with a sample collected from another individual*

     In this scenario the two samples collected will be typed by the forensic science laboratory and added to the NDDSA database. If a match occurs with evidence samples in the database, a verification sample will be requested and re-typed in order to confirm the match. Unfortunately this would most likely lead to the exclusion of both parties in their respective cases.

   - *Scenario 2 - the police officer collecting the sample contaminates it with their own DNA*

     In this scenario the sample will be typed by the forensic science laboratory and most likely not added to the NDDSA database. The reason for this is that DNA profile generated is likely to end up being a mixture of the DNA profiles of the police officer and of the suspect, and will therefore not be used for interpretation by the forensic science laboratory. A new sample will be requested for the investigation.

   As can be seen from the two scenarios discussed above there are existing quality control measures and protocols that allows for the detection and correction of such errors. Additional preventative measures can be put in place as well.

4. *What is the possibility that a police official could physically harm a person when taking non intimate samples in terms of Section 36; violate their constitutional rights or that this mandate to take samples could become a form of victimization at the hands of the SAPS?*

   This is probably the most sensitive and probably the most controversial of the issues regarding the amendments, and there are several different perspectives which need to be taken into account to

make the whole concept of using non intimate samples feasible. Provided that this aspect of the new legislation is strictly controlled by the SAPS, it should be possible to prevent negative public opinion to this new crime investigation approach. Here are some suggestions in this regard:

- Exercising this power should preferably be *limited to police officers trained specifically* for the purpose of taking non-intimate samples. Having dedicated personnel who perform this function should limit abuse of the situation by the average police official and engender trust in this process with the general public.

- Non intimate samples *should only be taken for specific offences and under controlled conditions*. This will have the advantage of inducing a measure of public confidence; a measure of control, and increase effectiveness during the initial phases of implementation. Limiting the relevant offenses initially will also limit the chaos which may take place if police members start to collect samples at random and flood the SAPS FSL with non-intimate samples. It is clear that a set of conditions and procedures to regulate the taking of non-intimate samples will have to be set up within the SAPS, and proper training will have to play a major role, as it has in other countries that have followed a similar approach. Stringent policies and procedures with regard to the misuse of this power should also be put in place by the SAPS *prior to the enactment of this legislation, and not as an afterthought*.

- If outsourcing of samples is to be viable in future, it will be necessary to determine which of the non-intimate sample types will be handled by such parties. Handling different sample types will significantly impact on the cost per sample and the speed with which such samples can be processed. It is very likely that at a later stage SAPS will realize that a single format of sample, whether buccal swab or blood finger prick - still works best, instead of all the options listed in Section 36A.

5. *Abuse of the Genetic Privacy of the individual: the concept of genetic discrimination*

Although this issue has already been addressed indirectly in some of the previous sections, it does require that the following points be re-iterated to ensure public confidence in the NDDSA and the DNA profiles contained therein.

DNA is referred to in the media and literature, and has become entrenched in the mind of the average person some mystical substance that can reveal all your deepest secrets for the world to see. Popular television series frequently extol the "*magical*" ability of forensic DNA typing to pinpoint the perpetrators of crime.

Even though forensic DNA typing is most definitely the most powerful criminal investigative tool since the advent of fingerprints, it is not intended to expose a person's genetic secrets for all to see. The reason for this is that forensic science only targets those genetic sequences in DNA which are unique to individuals, and not the sequences or "genes" which indicate for example the individual's

predisposition to heart disease; or that may indicate phenotypical (physical) characteristics such as e.g. skin colour, eye colour or hair colour.

Apart from gender, which is frequently important in rape investigations, the DNA profiles generate for the NDDSA contains *no information about the physical characteristics of the individual*. It consists of a set of numerical values which is highly unique to each person, and can be equated to a very long identity number. The database and its content will therefore not be of any value to any party but the SAPS FSL, who is the custodian of the NDDSA and who can compare these values to those obtained from evidence collected at e.g. crime scenes.

Therefore nobody accessing this information without access to the related case information will be able to use it for any purpose whatsoever – it is as good as pieces of a puzzle, with only the SAPS FSL in a possession of the necessary information to decode and put together the pieces.

Although forensic science is interested in DNA which may give information about physical characteristics and research into such areas are ongoing, the majority of forensic scientists strongly believe that using such information is unethical. The reason for this is that including other DNA information in forensic DNA databases could lead to incorrect association of DNA sequences with criminal behavior, social stratification and even genetic discrimination. This in turn could lead to a genetic victimization of groups of individuals based on a so-called "criminal gene" or specific genetic characteristic, which is making an assumption that an individual's actions is purely a product of their genetics, and not their environment as well.

Most of the world's largest forensic DNA database, including the NDDSA, makes use of exactly the same technology and DNA sequences and *respects the genetic privacy of all individuals by limiting the use of the DNA profiles to criminal investigations only.* Countries such as the United States of America and the United Kingdom have invested significantly in the generation of forensic DNA databases which use the same technologies, chemistries and operational concepts that is used in South Africa by the SAPS FSL. None of these countries include DNA information on their databases that could lead to genetic discrimination or victimization of any group/s based on the prevalence of their association in crime, physical characteristics or predispositions to any pathology.

Conclusion

FDC (Pty) Ltd hopes and trusts that the information provided in this document may serve to assist in the further assessment of the Bill. For additional information please refer to the contact information below.

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