



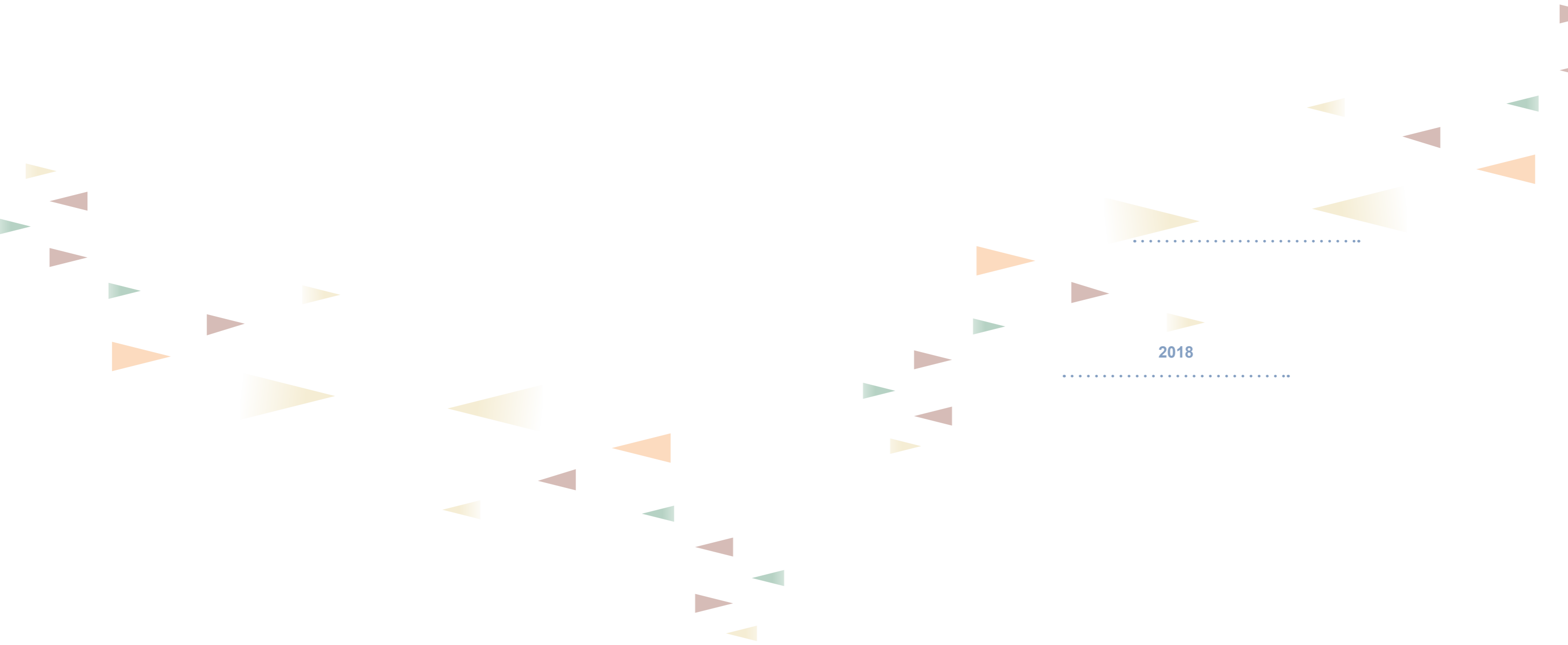
# **Evaluation of the Impact of Human Settlements Development Programmes on the environment during implementation of the 2nd edition of Environmental Implementation Plan**

SUMMARY REPORT



**human settlements**

Department:  
Human Settlements  
REPUBLIC OF SOUTH AFRICA



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## Acronyms

2nd. ed. EIP	Second edition Environmental Implementation Plan
BNG	Breaking New Ground
BRT	Bus Rapid Transit
CoGHSTA	Co-operative Governance, Human Settlements and Traditional Affairs
CSIR	Council for Scientific and Industrial Research
CRDP	Comprehensive Rural Development Programme
DDR	Detailed Design Report
DEA	Department of Environmental Affairs
DHS	Department of Human Settlements
DM	District Municipality
EIP	Environmental Implementation Plan
EMPr	Environmental Management Programme
IDP	Integrated Development Plan
LM	Local Municipality
NDP	National Development Plan
NEMA	National Environmental Management Act
OSR	Outline Scheme Report
PDR	Preliminary Design Report
SANS	South African National Standards
PHDP	Provincial Multiyear Housing Development Plan
VIP	Ventilated Improved Pit (toilet)

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## Executive Summary

The Department of Human Settlements (DHS) conducted an evaluation study to understand the impact of Human Settlements Development Programmes on the environment during implementation period (2009-2014) of the 2nd edition (ed.) Environmental Implementation Plan (EIP). The objectives of the study included to evaluate how human settlements development programmes were implemented to make provisions for environmental compliance (through legal frameworks, institutional arrangements, community participation and co-operative governance); and to determine the environmental impacts of human settlement developments, during the timeframe of 2nd ed. EIP.

The study included: an analysis of various DHS policies, plans, and programmes to evaluate provisioning for environmental compliance; data collection from a sample of implemented DHS projects which included a qualitative data collection through the review of environmental reports (compiled for human settlement developments) to establish a baseline of environmental impacts and the related risks thereof; and quantitative data collection from sample project stakeholders who responded to questionnaires and interviews in which enquiring about the inclusion of environmental considerations in DHS project implementation was done, as was envisioned in the 2nd ed. EIP, and lastly, to obtain clarity on co-operative governance and intergovernmental structures that may have been in place during that time.

A thematic map was developed in which impact frequency and risk ratings were combined, which provides DHS with a platform from which planning for monitoring, evaluation and reporting of impacts may be done. The information would assist DHS to respond to the requirements of NEMA regarding the contents of an EIP. This, together with the evaluation of which of the environmental considerations were, or were not implemented in the sample projects, also provide indication of where improved co-operative environmental governance and intergovernmental relations are required to better monitor and evaluate environmental impacts caused by the implementation of DHS policies, plans and programmes, and to ultimately work toward the development of settlements as is envisioned in the NDP by 2030 and 2050.

The study concluded that biodiversity, land, and water, are the components of the natural environment (environmental impact themes) in which impacts were identified most frequently, which is indicative that these are the components of the environment that will most likely be affected by human settlement developments in any setting or location. The highest risks were indicated for the impact themes biodiversity, and land; in the former, developments that affect fauna and flora and reduce overall biodiversity of an area were high risk impacts; and in the latter, developments that affect land has a high risk when agricultural land is lost to developments.

The study established that environmental considerations are included in DHS policies, plans, and programmes, however the inclusion and consideration thereof in DHS developments were not easily identified, or where identified, the implementation rates thereof were low. The low rate of consider-

ation and implementation may be due to various reasons, one of which being that the 2nd ed. EIP requires improved contextualisation and elaboration of implementation or compliance requirements.

The level at which environmental considerations were indicated to be included in DHS developments during the 2009-2014 period is indicative of the co-operative governance and intergovernmental relations that exist between different sectors and spheres that should be involved in sustainable human settlement planning and implementation. Relations between the housing development implementing entities and town planning, engineering, environmental departments and the local and provincial human settlement departments were evident to limited. Absence of adequate relations resulted in the development of human settlements where co-operative environmental governance and maximum benefits of sustainable development did not prevail, which leads to continuing impacts on the environment at a greater scale or rate than what would have been taking place if holistic mitigation measures were considered in planning stages.

The results of the study provide the DHS with a platform from which decision making should take place when future EIPs are developed. It also provides DHS and DEA with an indication of the pertinent environmental impacts caused by DHS developments, and it provides indication for which of the impacts improved co-operative governance and intergovernmental relations are required to ensure that sustainable human settlements are being developed in the truest sense of sustainable development, namely where all the pillars of sustainable development (the economy, society, the environment, and governance structures) are considered and consulted prior to implementation of policies, plans and programmes.

## 1. Background

The South African Department of Human Settlements (DHS), hereafter referred to as the Department), has aided 20 million South Africans through the delivery of 4.3 million houses and subsidies since 1994, making it a worldwide leader in housing delivery (Sisulu, 2016). With a growing population and high immigration rates increased human settlement development is required, which brings about an increase in natural resource consumption (DEA, 2012). The DHS responds to the South African Constitution (South Africa, 1996), which, through the Bill of Rights, provides a basis on which a just and fair society should be built, which includes that each citizen has the right to adequate housing. The Constitution (South Africa, 1996) also declares that each citizen has the right to a clean environment and the Constitution promotes that development should be sustainable.

Sustainable development is, in South African legislation, promoted through the National Environmental Management Act (NEMA), Act 107 of 1998. NEMA (South Africa, 1998) addresses the three pillars of sustainable development in declaring "...sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations". Thus, for the DHS to deliver sustainable human settlements, the three pillars of sustainable development must be con-

sidered in the planning and delivery of human settlements. The pillars of sustainable development should be based on sound governance structures.

An optimally functioning government includes co-operative governance between sectors and spheres. Chapter 3 of the Constitution (South Africa, 1996) specifies requirements for co-operative governance in the country. The Constitution lists concurrent government functions in Schedules 4 and 5, which include functions related to environmental matters. Henceforth, the NEMA includes specifications for co-operative governance of environmental matters which require each Organ of State that exercises functions that may affect the environment to report thereon through the development of Environmental Implementation Plans (EIP) every five years (South Africa, 1998).

DHS is focussed on delivering sustainable human settlements through the implementation of its policies, plans, and programmes, and in doing so aims to meet the requirements specified in the NEMA regarding EIPs. In effort to ensure the DHS is abreast of the impacts on the environment that occur as a result of their policies, plans and programmes implementation, the Department has set out to determine what the baseline of environmental impacts are and if adequate provision for environmental considerations are made within their policies, plans and programmes, through conducting an evaluation study of projects implemented in time period during which the DHS's second edition (2nd ed.) EIP was applicable, which was 2009-2014.

## 2. Introduction

The development of human settlements is a land use process that has significant impacts on the environment (UN, n.d.). The NEMA (South Africa, 1998) acknowledges that “many inhabitants of South Africa live in an environment that is harmful to their health and well-being” and that “everyone has the right to an environment that is not harmful to his or her health or well-being” and further states that “the law should ensure that organs of state maintain the principles guiding the exercise of functions affecting the environment”. To contribute to better living conditions for residents of South Africa, the DHS developments should include consideration for environmental impacts that are caused during construction, and that continue to take place once beneficiaries occupy the housing developments. For this reason, it is pertinent that DHS comply with the environmental regulations, norms and standards applicable to the implementation of their policies, plans and programmes, and holistically report thereon to the DEA, through the Department's EIP, and in doing so, contribute to co-operative governance as is required by NEMA and the Constitution.

### 2.1 Problem statement

The DHS has, over the years, achieved remarkable results through contribution to transformation of the historic apartheid spatial planning and through the development of areas where people live in close proximity to economic opportunities and social amenities (Sisulu, 2016). The development of

human settlements is a land use process that has significant impacts on the environment through being the single largest public investment in land development, which range from disturbance and fragmentation of ecosystems, high demand for natural resources and energy, air and water pollution, contamination of water ecosystems, demands for transport, which leads to carbon emission, and many other environmental impacts associated with human settlements development (DEA, 2012). These impacts must be managed throughout the Department's plans to working towards the achievement of its commitments of delivering 1.5 million housing opportunities by 2019.

In ensuring compliance with the requirements of NEMA, an EIP was developed for the period of 2009-2014, within which a set of environmental indicators were included as applicable to human settlement developments; these indicators, and aspects of environmental management that formed part of this study are included in Chapter 3 and Chapter 4 of the DHS 2nd ed. EIP. Comprehensive and successful application of the EIP and its purpose required evaluation thereof, the results of which would be used to inform future EIP development. The DHS has thus initiated this project to conduct an evaluation of the impact of human settlements development programmes on the environment during implementation of the 2nd edition of environmental implementation plan.

Therefore, the question that this study attempted to address is: “Do policies and programmes of human settlements development make explicit provisions for considerations of environmental management in their implementation as envisioned in the 2nd edition of EIP?”

### 2.2 Goal and objectives

To respond to the problem statement, a goal and objectives were identified for the study, as is detailed following hereon.

#### 2.2.1 Goal of the study

The main goal of this project was to evaluate how human settlements development programmes were implemented to make provisions for environmental compliance (through legal frameworks, institutional arrangements, community participation and co-operative governance).

#### 2.2.2 Objectives of the study

The primary objectives of this study were to:

- Determine the impact of human settlements development programmes on the environment; and
- Determine the effects thereof (human settlements developments) during the implementation of the 2nd ed. of the Environmental Implementation Plan.

## 2.3 Method of research

Research was conducted by means of a literature study and empirical survey.

### 2.3.1 Literature study

This literature study included<sup>1</sup>:

- An overview of existing theories, concepts, and definitions relevant to human settlement programmes and planning, environmental impact management, legal contexts for environmental considerations in human settlement development, sustainable development context, and an international perspective on housing and human settlement developments;
- Evaluation of the provisioning for environmental considerations in the literature DHS policies, plans and programmes.

### 2.3.2 Empirical study

Empirical research was conducted during which quantitative and qualitative data sampling and analysis was done. Data collection included<sup>2</sup>:

- (1) A desktop review of environmental impacts caused by human settlement developments through the review of environmental reports developed for human settlement and housing developments;
- (2) Surveys and questionnaires issued to government officials of the relevant sectors and spheres of government, to gain understanding of their perceptions of environmental impacts, the extent to which the 2nd ed. EIP was implemented or applied to the sampled projects, as well as to establish what co-operative governance structures were in place to include environmental considerations as specified in the EIP in the developments.

Reviewing environmental reports for human settlement developments was done to develop a baseline schedule of environmental impacts, an environmental impact risk matrix, to calculate the risk of the environmental impacts, and subsequently develop a thematic map of impacts. This allows the DHS to better respond to the requirements of NEMA regarding EIP development, especially when considering the Department's need to respond to the environmental sector priority areas. The results of the study would provide the DHS with a platform from which strategies and actions may be devised to respond to the monitoring and evaluation of environmental impacts and hence to ensure co-operative environmental governance and sustainable development prevail, in co-operation with DEA and other relevant organs of state.

<sup>1</sup>A list of documents reviewed is available in the full study report (c.f. 1.3.1. Literature study)

<sup>2</sup>Limitations to the original evaluation study plan's data collection, and other detailed limitations to the study are specified in the full study report (c.f. 1.4 Limitations to the study). An abbreviated version of the limitations is included in the summary report (c.f. 2.4 Limitations to the study).

### a) Selection of the sampling frame

The DHS HSS database provided project information from which a sample had to be selected. A filtering<sup>3</sup> process was applied to the data to provide the sample population which included human settlement development projects that were implemented and completed in 2nd ed. EIP timeframe (2009 – 2014).

### b) Sampling methodology

The requirements for the study were that the sample should include 10% of the sample population and that the sample should include all provinces, however the sample selection should allow for the inclusion of a greater percentage of projects per province in provinces in which a greater percentage of total projects were implemented. The elective sampling method suited for this study was non-probability sampling which allows for members of the population being selected in some non-random manner (Bhattacharjee, 2012). The quota sampling method, with convenience sampling had to be applied, in which samples were selected according to the needs of the study team (Mutinta, 2013). This sampling method produced a sample size of 61 projects; distributed across 9 Provinces; which included 22 towns in 21 local municipalities, in 21 district municipalities; and included DHS projects of 12 different policies, plans and/or programmes.

The selection would allow sampling from the District Municipalities (DMs) and Local Municipalities (LMs) in which the most environmental impacts would occur based on frequency of project implementation in the respective provinces, thus by establishing the effectiveness of EIP implementation from these DMs and LMs would allow DHS to identify causes for ineffective implementation of the EIP were, rectify these causes, and contribute to greater implementation of the EIP and optimally reduce the impacts on the environment in areas in which the developments (and related impacts) occur the most frequently.

### c) Development of the questionnaire<sup>4</sup>

The 2nd ed. EIP's Chapter 3 (Actions to ensure compliance with environmental policies and laws) and Chapter 4 (Recommendation for environmental management) were evaluated for what the EIP aimed to facilitate regarding inclusion of environmental considerations through the implementation of DHS policies, plans and programmes. Evaluation of these two chapters lead to the identification and grouping of data sources and categories, namely: town planning; environmental; engineering; and human settlement related data. Questions were formulated for each category and to evaluate the rate of inclusion or consideration of inclusion of the contents of Chapters 3 and 4 (of the 2nd ed. EIP) in the implementation or development of the projects selected in the sample.

<sup>3</sup>The filtering process is included in the full study report (c.f. Appendix B).

<sup>4</sup>Questionnaires per information category is included in Appendix A of this Summary Report.

#### d) Identification of stakeholders

The stakeholders to the project were defined as:

- Implementers of DHS developments and project information data owners (or data keepers).
- Housing and human settlement departments, and town planning departments at local municipalities and provincial governments in which sample projects were implemented, were identified as key stakeholders (Town planners were identified as key stakeholders due to the information categories and specific data required since the majority of the information required should ultimately be kept in a town planning application master file (or the Motivating Memorandum).

#### e) Data collection process

The data collection phase prioritised provinces to which the easier and adequate access could be obtained (based on sample location, and rate of stakeholder responses), after which other provinces were targeted. The prioritised provinces (and related local sphere government departments and officials) included Gauteng, KwaZulu-Natal, Limpopo, and the Eastern Cape. A total of 132 people were included in electronic and telephonic communication related to data collection. Five physical meetings which resulted in obtaining usable data were held within the two provinces of Gauteng and Limpopo. Numerous physical engagements within Gauteng, Limpopo, KwaZulu-Natal, and the Eastern Cape provinces between the study team and various stakeholders of various departments were held (or were attempted) which did not result in obtaining of usable data.

#### 2.4 Limitations to the study

Study results were affected by factors related to obtaining data and the related evaluation and interpretation thereof. A brief indication of limitations is provided below:

- (1) Obtaining and establishing communication with contactable individuals relevant to various sample projects (contactable individuals was not obtained for all samples, or feedback from stakeholders were lacking);
- (2) Existence of information (for various sample projects there were no or vague data records);
- (3) Project exemptions from conducting environmental assessments (a portion of the sample projects were exempt from conducting environmental assessments);
- (4) HSS database complications (details captured in the HSS database differ from the way in which town planners capture details of townships in which settlements are developed, which made tracking of data challenging. The way in which naming of projects were captured on the HSS data base made it challenging for some officials to identify the exact project included in the sample).

The limitations resulted in the requirement to consult environmental reports for human settlement and housing development projects which did not form part of the study sample (limitations of the study findings are provided in section 6.3 Limitations of the study findings).

#### 2.5 Chapter classification

**Chapter 1:** *Introduction, problem statement, goal and objectives* - this provides details of the terms in the chapter heading, as well as the study methodology applied.

**Chapter 2:** *Literature Review* discusses theories, concepts, and definitions relevant to human settlements and environmental impacts, legal contexts for the EIP and international perspectives on housing and human settlement developments and related environmental impacts.

**Chapter 3:** *Environmental Scan* discusses environmental impacts caused by human settlement developments and the risks related to the impacts..

**Chapter 4:** *Empirical Study* provides detail and results of the data analysis.

**Chapter 5:** *Conclusions and recommendations* includes conclusions derived from the study and recommendations that were made.

### 3. Literature Review

#### 3.1 Introduction

The DHS developed the 2nd ed. EIP to assist in implementing actions to ensure compliance with environmental regulations, and environmental norms and standards, as is required from DHS, by Chapter 3 of NEMA (South Africa, 1998). The objective of evaluating if DHS policies, plans and programmes make explicit provision for considerations of environmental management allows for contextualisation of the relevant terminology used in DHS documents, from this conclusions could be drawn to state whether or not the context in which DHS documents include environmental considerations would require the reader, or responsible organ of state from whom action or implementation is required, to have prior understanding the terminology, or if it is easy to interpret within the document in which it is read, and allow the reader to follow and implement the environmental considerations included in DHS policies, plans or programmes. Definitions of various terms were reviewed to provide understanding and context of the used terms - the terms reviewed included economic-, social-, and environmental sustainability; human settlements, housing and shelter (and adequate shelter), sustainable development, and sustainable human settlements

The legal context for the requirements to develop an EIP was evaluated to provide perspective for this aspect of the study, and international perspectives on environmental impacts and reporting thereon from human settlements developments were also evaluated.

### 3.2 Definitions relevant to sustainable human settlements

Many definitions of “Sustainable Development” exist, the most notable, often referred to as the first definition, was defined during the World Commission on Environmental and Development, also known as “the Brundtland Commission” in the “Our Common Future” report. Sustainable development was defined as: “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UN, n.d.).

The Brundtland Commission’s definition of “sustainable development” is entrenched in the principles which NEMA prescribes for development (Chapter 2 of NEMA) (South Africa, 1998). The definition and the principles in NEMA, clearly indicate that the effective management of the environment, the economy, and society is required for development to be sustainable.

Components of sustainable development (with specific focus on the environmental component), included in DHS documents, include the following: the 2nd ed. EIP (South Africa, 2009), Breaking New Ground (BNG) (DOH, 2004), and the Housing Act (Act 107 of 1997) (South Africa, 1997). These documents include the following regarding the environmental component of sustainable development:

- The importance of the natural environment within which the human settlement is built is recognised in the definition of Housing (as is included in the 2nd ed. EIP), and in the definition of a sustainable human settlement in the BNG;
- land use and land use planning is noted as an aspect that should be considered in the development of human settlements, in the 2nd ed. EIP, and the BNG;
- access to services, and to social and economic amenities are aspects to be considered in human settlement developments, as is raised in the BNG, and the Housing Act;
- security of tenure is noted by the EIP, the Housing Act, and BNG as important aspects of sustainable human settlements.

Figure 1: Spheres of Sustainable Development



The evaluation of key documents of the DHS provides proof of the inclusion of the consideration for the natural environment in DHS documents; other aspects that would enhance the natural environment considerations in developments (namely land use planning, which is related to spatial planning), are also included. In some instances the “natural environment” is not directly referred to in the reviewed DHS documents, but the environment may be inherently affected by aspects discussed in the documents, e.g. references are made to service delivery (including water and energy, and sanitary facilities provisioning). This may be linked to impacts on the environment such as the use of natural resources, and the creation of waste and the disposal and/or treatment thereof (the use of natural resources is required in the treatment or disposal processes). Provisioning of these services for human settlements has an impact on the environment, however the relation between development and installation of service delivery infrastructure, and the consecutive use of the services and environmental resources cause environmental impacts, and these impacts may not always be obvious in the DHS documents.

There should however be consideration for DHS’s mandate which is to deliver housing, and not to protect the environment and hence should not have to include detailed environmental considerations in all or many of the Department’s documents, however there should be clear inclusion of environmental considerations in DHS documents (or clear reference to a DHS document which would contain relevant environmental considerations). Currently, the EIP is the platform that may be used to provide details of impacts related to DHS developments, and actions implemented by DHS to ensure compliance with environmental regulations and norms and standards.

It may be concluded that the reviewed documents include consideration for social and environmental components of sustainable development. The details thereof do however not provide a holistic indication of what the environmental considerations are that must be included in human settlement planning and development. The impacts on the environment referred to in the reviewed documents have greater emphasis on the impacts resultant from resource usage and waste generation by beneficiaries (or residents) of the settlements (i.e. impacts that occur as a result of human occupation of the built environment), and less emphasis on the impacts caused by the physical construction of the settlement. It is however during planning stages of human settlement developments that the impacts on the environment of both the construction phase and occupation by residents may be mitigated.

Whilst the DHS would be responsible for the impacts caused during construction, it is also the DHS that would influence the extent of the impacts caused by the residents of the settlement; e.g. efficiencies of the fittings (e.g. taps, lights) installed in houses, fronting, and insulation included in a housing unit would influence the continued, daily impacts resultant from resource usage by occupants of the houses.



### 3.3 Legal context

The legal reference source for environmental law in South Africa is found in the Constitution of the Republic of South Africa, Act 108 of 1996 (South Africa, 1996). The Constitution places the environment in high priority to which all organs of state are bound, as is evident from the Bill of Rights (section 8(1) of the Constitution). The Constitution provides context for the mandate of DHS, regarding provisioning of houses (section 26(1)), and the DHS has to ensure the enactment of this right without infringing other constitutional rights, such as the right to a clean environment. It is noteworthy that this right includes components of the definition for “sustainability”, namely the preservation of the environment for present and future generations.

Fulfilling the mandate to deliver houses and sustainable human settlements whilst ensuring that the environment is not jeopardised, requires working with other sectors and departments whose mandate includes protection and management of the environment. This is provided for in the Constitution (South Africa, 1996), in Chapter 3, titled “Co-operative governance”, and co-operative governance of the environment is facilitated through Chapter 3 of NEMA (South Africa, 1998), which calls for DHS to develop an EIP in which to report on the impacts of their activities on the environment and, amongst other requirements, indicate how the DHS gives effect to the principles of co-operative governance and coordinates functions to ensure promotion and protection of a sustainable environment (South Africa, 1998).

In the DHS 2nd ed. EIP, the DHS provided discussion on the actions which have been implemented, or would have been implemented in their developments, and it provides guidance for action that should have been taken. The 2nd ed. EIP does however not provide clarity on actual actions taken (or actions that should have been taken) to ensure compliance with specific environmental legislation or environmental norms and standards that may have been applicable to the DHS’s developments. The EIP also includes recommended actions for implementation, which include considerations of multiple aspects that could contribute to reduced environmental impacts of human settlement developments, however the wording in the 2nd ed. EIP is broad and left open to interpretation by the reader; nor does the 2nd ed. EIP indicate to whom the recommendations are directed.

The 2nd ed. EIP also included discussions of aspects that may never fall within the DHS’s ambit to implement, or monitor (such as participation women and children in environmental management). Without the EIP stating which actions should be taken to ensure compliance with which laws, regulations, norms, and standards, or with the broad terms in which its recommended actions for implementations are written, and with the inclusion of content deemed irrelevant to DHS, monitoring and evaluation, and subsequent reporting on environmental considerations in DHS developments would be challenging.

### 3.4 Conclusion

The answer to the question of whether or not sufficient provisioning is made for environmental considerations in DHS policies and programmes is not a straight forward response, since the reviewed DHS documents address environmental considerations; however the level of depth, the quality, or extent of environmental consideration inclusion may have to be elaborated on to meet the intention of the 2nd ed. EIP; however, since it is not the DHS mandate to protect the environment, alternative documents, whether it is a DHS document or other organ of state or entity document (e.g. DEA, CSIR, and/or SANS) may be more suitable in which to include environmental considerations to which DHS documents should refer. A first world example hereof is the Australian department of the Environment’s environmental indicators for the state of the environment reporting for human settlements, which included authors from various sectors, including environment, engineering, housing, health and welfare, land and water, and transport (Newton et al., 1998).

## 4. Environmental Scan

### 4.1 Introduction

To gain insight into the impacts caused by DHS developments, an environmental scan<sup>5</sup> was conducted. The environmental scan included evaluating the 2nd ed. EIP for the extent to which the environmental themes (refer to section 4.2.1) were addressed therein.

A baseline schedule of environmental impacts, a risk matrix, impact risk rating, and thematic map of the impacts were produced. The information produced from this study would allow the DHS to identify which component of the environment may have been most frequently or most severely impacted on by activities related to human settlement developments. Such information would allow for the development of impacts response mechanisms to better manage impacts on the environment.

### 4.2 Baseline schedule of environmental impacts

#### 4.2.1 Theme development

Environmental impacts, as identified through reviewing of various environmental reports, were grouped into impact themes, which was informed by the Draft 3rd Edition Guidelines for Environmental Implementation and Management Plans (the Guidelines) (South Africa, 2013). Themes were broad (and were titled as “Impact themes”), which do not describe with sufficient clarity what the impact relates to, and would not allow for adequate response measures to be developed, thus “secondary impact themes” were developed and linked to the “Impact themes”.

<sup>5</sup> The term “Environmental Scan” used in this study refers reviewing environmental reports compiled for human settlement developments. The term “environmental scan” does not refer to an “environmental screening” or “environmental scoping” – these terms are explained in the main study report (c.f. 3.2.1. Theme development).

The impact themes however are not equally impacted by the DHS developments, thus may not require equal response, monitoring and evaluation, and reporting measures. The risk of impacts may also be influenced by the severity of the impact, the extent to which it occurs, the duration of the impact, and the likelihood of it taking place. These factors were considered in the risk calculation of each of the impact themes. The frequency at which the impact occurs, the sensitivity of the receiving environment to that impact, also bears influence on the risk of the impact.

### 4.3 Thematic map and risk matrix<sup>6</sup>

The development of the thematic map of environmental impacts considers the frequency of the impacts, as it was counted in the environmental reports reviewed, together with the risk ratings of each impact theme.

#### 4.3.1 Impact frequency

Impacts that were noted more often than other impacts in the reviewed reports provide indication of the impacts that may be expected to occur in various environments, and thus the frequency could provide an indication of impact themes that could require greater attention when considerations for environmental impact monitoring and evaluation are devised.

#### 4.3.2 Risk Calculation and risk average

Impact risks were calculated using the risk matrix, producing a risk rating per environmental impact theme and related secondary impact theme. To obtain an average risk rating for the impact theme and secondary impact theme, a numerical value was ascribed to risks (high = 3; medium = 2; and low = 1).

Table 1 serves as a reference for DHS to evaluate what impacts contain the highest average risk as well as the frequency at which the impacts were recorded. The table lists the main impact themes with related secondary impact themes; followed by an indication of the frequency at which impacts per theme were recorded, and the risk rating for the recorded impact. The average risk rating of the recorded impacts is indicated in the far right column of the table. The table indicates the impact to the theme “Air” (referring to air quality), and secondary impact theme, indicates that the air quality is affected by “emissions” from “equipment”, was recorded once, with a risk rating of 1 (or low risk); and the impact to the theme “Biodiversity” and secondary impact theme “ecosystem” was recorded four times, with risk ratings of 2, 2, 3, and 2 (medium, medium, high, and medium), which produced an average risk rating of 2 (medium) for impacts affecting this theme.

<sup>6</sup> The risk matrix and risk calculation is explained in greater detail in the main study report, (c.f. 4.3 Thematic map and risk matrix). The risk matrix is also included Appendix B: Risk Matrix of the Summary Report.

From this table it is deduced that an activity causing an impact to “Land: Agriculture” could be a high risk impact, and impacts caused to the theme “Water: Water Reserve”, could be medium risk impacts.

Table 1: Frequency and risk of each impact theme<sup>7</sup>

Impact Theme	Secondary Impact Theme	Frequency	Impact Frequency and Risk Rating	Risk Average
Air:	Emissions - Equipment	1	L	1
Air:	Emissions - Waste	1	M	2
Air:	Dust	1	L	1
Air:	Emissions - Fugitive	1	L	1
Biodiversity:	Fauna & Flora	2	H M	3
Biodiversity:	Aquatic	1	M	2
Biodiversity:	Biodiversity	1	H	3
Biodiversity:	Habitat	1	M	2
Biodiversity:	Ecosystem	4	M M H M	2
Noise:	Noise	1	L	1
Social - Economy:	Employment	1	M	2
Social - Health:	Waste	1	M	2
Social - Health:	Land	1	L	1
Social - Health:	Water	1	L	1
Social - Safety:	Crime	2	M L	2
Social - Safety:	Injury	1	L	1
Land:	Agriculture	1	H	3
Land:	Ecosystem	2	L M	2
Land:	Pollution	4	L H L M	2
Land:	Erosion	2	M M	2
Visual:	Visual	1	L	1
Water:	Pollution	3	M	2
Water:	Water Reserve	4	M	2
Water:	Ecosystem	1	M	2
Water:	Disaster Risk	1	L	1

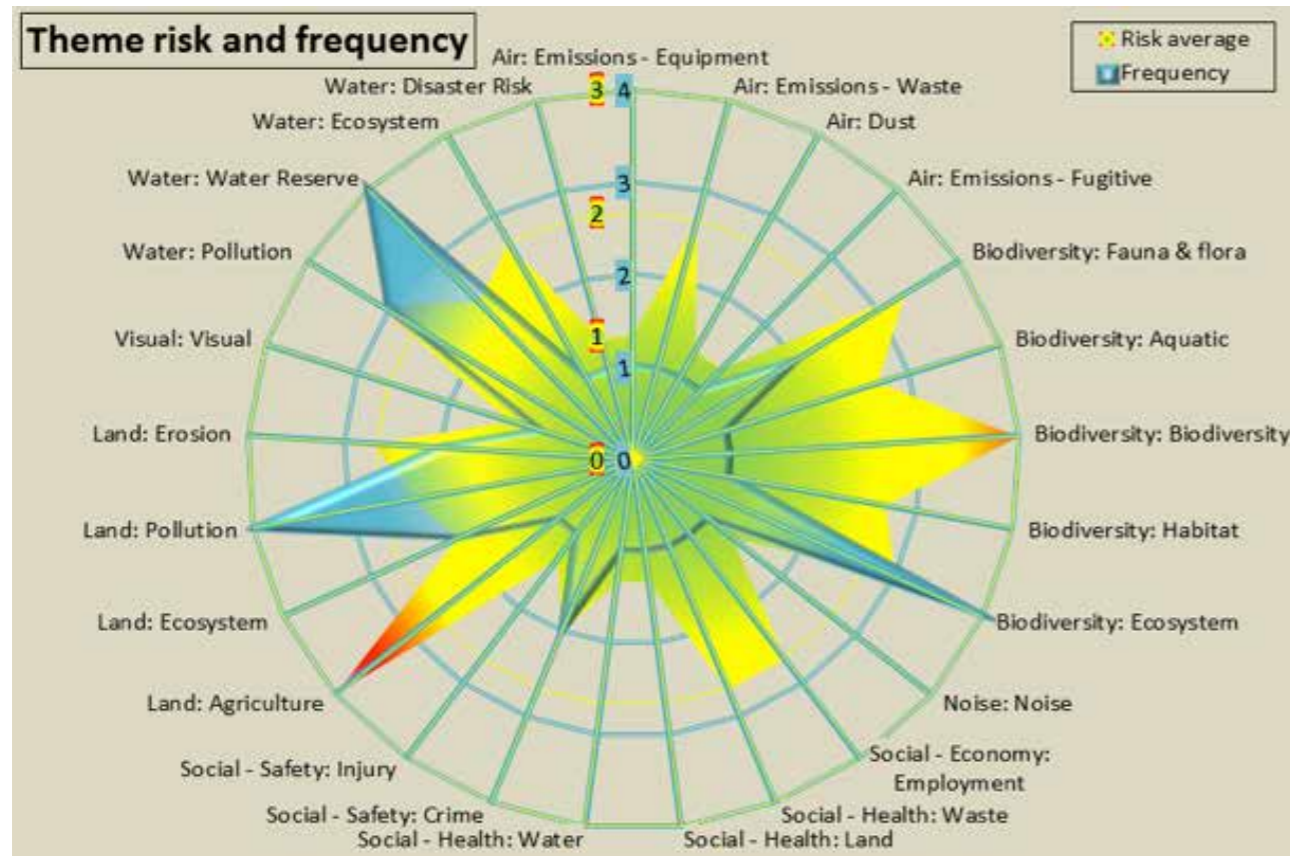
Frequency Key:

Risk Key:

1	Low	2	Low to medium	3	Medium to high	4	High	L	Low	M	Medium	H	High
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<sup>7</sup> Impact themes indicate the component of the environment affected; and secondary impact themes provide detail of how the theme is affected (or which component of the theme is affected). The impact theme “Air” refers to air quality being affected as a result of emissions caused by equipment, waste, fugitive emissions, and dust. “Biodiversity” is affected by specific impacts to fauna and flora, to aquatic life, habitats, or general impacts that affect biodiversity and ecosystems such as vegetation clearing and disruption in ecosystem food chains. “Land” refers to the quality of land being affected by development activities which may lead to land based ecosystems being affected through soil alteration, pollution, or erosion. Or land suitable for agriculture may be lost to developments. “Water” refers to water quality being affected by pollution, or ecosystems that may be affected (such as wetlands), or resources may be used, affecting the available water reserves. Socio-economic impacts caused by developments, which are recorded in environmental impact reports, include the theme for “Visual” impacts, referring to the aesthetics of the landscape being affected; “Noise” indicates that developments could cause noise disturbances. “Social” impacts relate to economic impacts of job creation or losses or unrest in local communities due to people of external communities being employed for in developments. Other social impacts relate to community “Health” that may be affected through waste disposal in the community, which could contribute to land and water pollution, and resultantly pose a threat to the health of those living in the area, or to those who are dependent on land and water resources for their livelihoods. Community “Safety” could be affected as crime or injuries on the development site may occur.

Figure 2<sup>8</sup>: Theme risk and frequency overlay thematic map



Impact themes and secondary impact themes with low frequency and low risks are: “Air: Emissions – Equipment”, “Air: Dust”, “Air: Emissions – Fugitive”, “Noise: Noise”, “Social – Health: Land”, “Social – Health: Water”, “Social – Safety: Injury”, and “Visual: Visual”. The themes with the highest risk are “Biodiversity: Biodiversity” and “Land: Agriculture”, followed by “Biodiversity: Fauna & flora”, “Biodiversity: Ecosystem”, and “Water: Pollution”.

#### 4.4 Environmental scan conclusion

A range of themes of environmental impacts provides a base from which to compare environmental impacts (that occur as a result of human settlement development policies, plans and programmes implementation), to the impacts discussed in the 2nd ed. EIP (Chapters 3 and 4). The themes were linked to the core focus areas specified in the Draft 3rd edition Guidelines for Environmental Implementation and Management Plans (South Africa, 2013).

The 2nd ed. EIP includes the majority of environmental themes being impacted (based on this study), however this does not yet indicate in detail the efficacy by which the 2nd ed. EIP allows DHS to monitor the impacts related to these themes. Future EIP development could elaborate on the indicators to incorporate more of the impact themes identified herein, whilst aligning it to the specifications in the Guidelines.

This indication of the frequency at which risks were recorded, and the average risk rating per impact theme and secondary impact theme are indicative of impacts that may require more detailed monitoring and evaluation than other impacts, and ultimately would contribute to improved co-operative environmental governance of these impacts.

Both frequency and risk ratings should be used to determine for which impacts monitoring evaluation action is required since an impact might not have a high risk rating, however it might occur frequently, which could have a great cumulative impact on the environment across all developments taking place throughout the country. Similarly, a high risk impact may not occur frequently, yet a once off impact occurrence could have a detrimental effect on the environment and the surrounding community.

#### 4.3.3 Thematic map and risk matrix findings

Figure 2 was developed using the contents of Table 1. It provides a thematic map indicating the theme frequency and risk rating of the impact. This serves as a graphic representation of the impact theme frequency and the risk rating of the impacts per theme.

Figure 2 indicates that impacts to the theme “Air” do not occur frequently (all secondary impact themes’ frequencies for the impact theme “Air”, are 1), and that the highest impact in this theme occurs to the secondary impact theme of “Emissions: waste” (emissions from waste), which has a risk rating of 2 (or medium). Impacts to the impact theme and secondary impact theme “Land: Erosion” occurs at medium frequency (2), and at an average medium risk rating of 2. The impact theme “Land: Agriculture” were not impacted frequently, namely 1 occurrence was recorded, but the average risk of impacts to this theme is high, with a rating of 3. Impacts to the theme “Water: pollution” occurs at medium to high frequency, rated as 3, and the average risk of such impacts are medium to high (greater than 2).

<sup>8</sup> The frequency thematic map is indicated in turquoise colour on the spider graph, and is plotted on turquoise axis lines. The risks plotted on the thematic map is done in different colours to indicate various risk ratings, as is used in the risk matrix, and are plotted on the yellow axis lines.

## 5 Empirical study

The quantitative results of the study are presented below and selected detail of the responses to questions is included in this report.<sup>9</sup>

The results include discussion of responses obtained regarding whether or not aspects listed in the Chapters 3 and 4 of the 2nd ed. EIP were included or considered in the implementation of the sample projects. The results thus provide indication the number and percentage of respondents who provided the following answers to the questions<sup>10</sup>:

<sup>9</sup> Qualitative findings per sample project are included in the main study report (c.f. Appendix A -).

<sup>10</sup> Detailed responses to each of the questions per province may be found in the full study report's Empirical study chapter (c.f. 4. Empirical Study).

### 5.1 Town planning results

Table 2: Town planning results

	Adequate Space	Health	Waste Planning	Land Use	Access to natural environment	Access to services: Food	Access to services: Water	Access to services: Sanitation	Access to services: Electricity	Densification	Title Deeds
<b>Number of responses per category</b>											
Yes		1	1	1	1	1	4	4	3	1	
No		19	19	19				19			1
Proof of consideration not obtained	61	41	41	41	60	60	38	38	58	60	41
Limited consideration							19				19
<b>TOTAL</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>
<b>Percentage of responses per category</b>											
Yes		1.6	1.6	1.6	1.6	1.6	6.6	6.6	4.9	1.6	
No		31.1	31.1	31.1				31.1			1.6
Proof of consideration not obtained	100%	67.2	67.2	67.2	98.4	98.4	62.3	62.3	95.1	98.4	67.2
Limited consideration							31.1				31.1

The results indicate that few projects considered or included town planning aspects covered in the 2nd ed. EIP (Chapters 3 and 4). "Access to services: Water" and "Access to services: Sanitation" were aspects for which the highest percentage (6.6%) of projects indicated consideration. This is related to the sample projects that were developed in already built up areas and on sites were selected for development based on the availability of many of these aspects. A large percentage (31.1%) of projects (all in one province) indicated that many of these aspects were not considered due to sample projects being in rural areas and that the development programme through which the sample projects were developed, at that time, did not require and/or allow for inclusion of such aspects. Where limited consideration for aspects (such as "Access to services: Water") is indicated as 31.1%, it relates to such services being considered, however there are varying standards or levels of such service delivery, and the DHS 2nd ed. EIP does not specify which level of service delivery is being sought.

1. Yes (the aspect was considered and included in the development);
2. No (the aspect was not considered for the development)
3. Proof of consideration not obtained (response to questions were not obtainable).
4. Limited consideration (the aspect was partially considered and/or partially included in the development; or was considered or monitored at a higher level than project level, and cannot be reported at project specific level).

The results section provides an overview of the responses to the questions per information category: town planning, environmental, engineering, and human settlements.

## 5.2 Environmental results

Table 3: Environmental results

	Environ- mental Sensiti- vities	Marginal land	Geo- technical studies	EMPr	Environ- mental Awareness	Specialist studies	Public Partici- pation	Culture/ Social impact	Waste monitoring	Hazardous environ- ment	Unique habitats	Air quality/ pollution	Water quality/ pollution	Electricity - affordability
<b>Number of responses per category</b>														
Yes	1	1	3	1										
No	21	2		19	19	21		21	19	21	21	21	21	21
Proof of consideration not obtained	39	39	39	41	42	40	40	40	42	40	40	40	40	40
Limited consideration		19	19				21							
<b>TOTAL</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>
<b>Percentage of responses per category</b>														
Yes	1.6	1.6	4.9	1.6										
No	34.4	3.3		31.1	31.1	34.4		34.4	31.1	34.4	34.4	34.4	34.4	34.4
Proof of consideration not obtained	63.9	63.9	63.9	67.2	68.9	65.6	65.6	65.6	68.9	65.6	65.6	65.6	65.6	65.6
Limited consideration		31.1	31.1				34.4							

The results indicate that, as with town planning aspects, very few projects considered or included environmental related aspects covered in the 2nd ed. EIP (Chapters 3 and 4). The highest percentage of projects for which consideration of any environmental related aspects could be indicated was the consideration and/or inclusion of the aspect “Geotechnical studies”, which shows that, of the 36% of sample projects for which proof was obtained, such studies was done for 4.9% of the sample projects, and for the remaining 31.1% respondents indicated that such studies were done in most cases, however clarity on whether or not such studies were done, could not be verified. For 1.6% of the projects, “Environmental sensitivities” and “Marginal land” was considered, and “EMPr” (Environmental Management Programme) reports were developed. The highest percentages for which “no” was answered was 34.4% of the projects. This relates to the conducting of environmental screening and subsequent required environmental reports. If the prior was not done, there was no proof or indication that “Specialist studies”, “Cultural / social impacts”, “Waste monitoring”, “Hazardous environments”, “Unique habitats”, “Air quality / pollution”, “Water quality / pollution” or “Electricity – affordability” was considered for the sample project developments. In the majority of instances this relates to the sample projects that were in rural areas, which were in many instances exempt from conducting environmental studies, and in other cases, the samples were developed in already existing townships or brown field developments which did not require specific environmental studies to be conducted. For 31.1% of projects, limited consideration for “Marginal land” and “Geotechnical studies” was indicated, and 34.4% was indicated for “Public participation”. These answers relates to the indication by respondents that there is an interpretation of what “Marginal land” may refer to, but may not include all areas that may be considered as “marginal land”. With regard to geotechnical

studies, the respondents indicated that some of the sample project developments did include geotechnical studies, but that this might not have been included for all of the developments. In terms of “Public participation” being conducted, respondents indicated that it was done, however it was not done for environmental requirements, nor to necessarily gain input regarding environmental matters, but was done to discuss ownership matters with the beneficiaries.

### 5.3 Engineering results

Table 4: Engineering results

	Adequate lighting	Heating & Ventilation	Adequate infrastructure: Water & Sanitation	Renewable energy	Energy - design standards	Energy - efficiencies	Energy - cost of energy	Water - efficiencies	Water - consumption	Water - cost of water	Access to services - Water	Access to services - Sanitation	Access to services - Electricity
<b>Number of responses per category</b>													
Yes			1								1	1	1
No	21	21	1	21	21	21	21	21	21	21	19	1	
Proof of consideration not obtained	40	40	40	40	40	40	40	40	40	40	41	40	41
Limited consideration			19									19	19
<b>TOTAL</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>
<b>Percentage of responses per category</b>													
Yes			1.6								1.6	1.6	1.6
No	34.4	34.4	1.6	34.4	34.4	34.4	34.4	34.4	34.4	34.4	31.1	1.6	
Proof of consideration not obtained	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	65.6	67.2	65.6	67.2
Limited consideration			31.1									31.1	31.1

The results indicate that very few projects considered or included engineering related aspects of the 2nd ed. EIP (Chapters 3 and 4). The highest percentage of projects for which consideration of engineering related aspect could be indicated was the consideration and/or inclusion of the aspects: “Adequate infrastructure: Water & Sanitation”, “Access to services: Water”, “Access to services: Sanitation” and “Access to services: Electricity”, at 1.6%. The respondent who provided indication that these aspects were considered stated that the sample project location was selected based on already available infrastructure services in built up areas. For 31.1% of sample projects respondents indicated that the “Adequate infrastructure: Water & sanitation”, and “Access to services: Sanitation” was included in the development, however this was VIP toilet structures and the respondent did not define the quantity or the level of access to such facilities per unit developed. Some of the sample projects were developed in rural town ship areas where energy related infrastructure services may have been supplied to the settlement, but not to household level – this is portrayed by the 34.4% and 31.1% indicated for multiple engineering aspects; and for other aspects with the same percentages, such as “Adequate lighting”, “Heating and ventilation”, “Renewable energy”, “Energy efficiencies”, “Cost of energy”, and “Energy design standards”, respondents indicated that house designs are done according to specific design codes standards, which does not include specifications for the aspects in question.

## 5.4 Human settlements results

Table 5: Human settlements results

	Women workforce	Youth & Women workforce	Tenure	Local Resource Use	Waste material used in buildings	Urbanisation	Title Deeds	Densification	IDP	PHDP	Participation	Funding	Trees	Ceilings	Land acquisition
<b>Number of responses per category</b>															
Yes			21	19			3	1	20	19	20	1		1	
No				1	19	19	19	19					20	19	
Proof of consideration not obtained	38	38	39	41	42	42	39	41	41	42	41	60	41	41	61
Limited consideration	23	23	1												
<b>TOTAL</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>	<b>61</b>
<b>Percentage of responses per category</b>															
Yes			34.4	31.1			4.9	1.6	32.8	31.1	38.2	1.6		1.6	
No					31.1	31.1	31.1	31.1					32.8	31.1	
Proof of consideration not obtained	62.3	62.3	63.9	68.9	68.9	68.9	63.9	67.2	67.2	68.9	67.2	98.4	67.2	67.2	100
Limited consideration	37.7	37.7	1.6												

The results indicate that few of the aspects related to human settlements information included in Chapters 3 and 4 of the 2nd ed. EIP could be reported on as being considered or included in the sample projects. Planting of trees at settlements was the aspect with the highest percentage (32.8%) for which no consideration or inclusion was indicated, followed by 31.1% for aspects of "Waste material used in buildings", "Urbanisation", "Densification", "Title Deeds", "Densification" and "Ceilings". Regarding the planting of trees, one province's responses related to all sample projects that were developed in rural areas, and trees do not get planted in rural area developments, the reasons therefor was not defined, however this may be due to the level of water service and installations at rural areas which also had a high percentage indication of such aspects not being included in rural developments. Aspects for which 31.1% was scored relate to the developments being in rural areas to which respondents stated that "Title deeds" were not issued for such developments, or the developments were in areas that were not formalised townships yet, hence title deeds could not be issued. "Urbanisation" was stated to only be documented for greenfield developments in urban areas, not rural areas, and densification is only considered for urban developments. Lastly, respondents who indicated that ceilings were not included in developments related the reason to the developments that were rural, and such projects specifications did not include the installation of ceilings. The aspects for which limited consideration was indicated comprises of 37.7% of the sample projects, which were "Women workforce", and "Youth & women workforce". Respondents indicated that this aspect is only reported at provincial level since it is a provincial target, meaning that this has to be implemented at project level, and is taking place, however project specific data was not available.

## 6 Conclusion and Recommendations

The chapter provides conclusions derived from the various activities undertaken during this study and includes recommendations regarding this evaluation study.

The problem statement was: "Do policies and programmes of human settlements development make explicit provisions for considerations of environmental management in their implementation as envisioned in the 2nd edition of EIP?"

The main goal of this study was to:

- Evaluate how human settlements development programmes were implemented to make provisions for environmental compliance (through legal frameworks, institutional arrangements, community participation and co-operative governance).

To reach the main goal, two objectives were formulated, which were:

- Determine the impact of human settlements development programmes on the environment; and
- Determine the effects thereof (human settlements developments) during the implementation of the 2nd ed. of the Environmental Implementation Plan.

## 6.1 Conclusion

Conclusions are grouped according to the literature review and empirical research.

### 6.1.1 Conclusions regarding DHS and its inclusion of environmental considerations in Policies, Plans and Programmes

The main conclusions regarding inclusion of environmental considerations in DHS documents pertain to the problem statement and the main study goal:

- Environmental considerations are included in DHS policies, plans, and programmes, however the inclusion thereof in developments are not easily identified, due to challenges related to obtaining verifiable data (which is related to record keeping and data capturing procedures and practices that are not uniform, or being implemented). Without obtaining data or access to data, or to contactable project references, the ability to identify what the institutional arrangements, co-operative governance mechanisms, and legal frameworks were that were in place when the sample projects were implemented, is not possible. This challenge may have led to project implementation that cannot prove the considerations of environmental compliance.
- Provision is made for environmental considerations and compliance in DHS policies, plans and programmes, however the effectiveness of the considerations therefor in the human settlement developments could not be adequately evaluated since the 2nd ed. EIP was published in 2009, and projects sampled during this period may have been approved prior to the publishing thereof; thus DHS documents developed after publishing of the 2nd ed. EIP may not have had an effect on the inclusion of environmental considerations in the implementation of DHS policies, plans and programmes and human settlement developments.
- Low response rate from stakeholders, and the low level of environmental information provided by respondents to the study may be indicative of limited functioning co-operative governance structures and agreements, legal frameworks, or institutional arrangements.
- Record keeping and information sharing between urban and rural town planners with human settlement departments are vague (proof of structures, or procedures were absent).
- Proof of a lack of environmental considerations during implementation was noted (projects were exempt from environmental studies – without clear indication why or under which regulation this was allowed, and what the conditions of exemption was), and other projects provided indication that there was consideration; verifiable documentation of this was however not obtained.

- Environmental impacts listed as ones that occur most frequently, or impacts with the highest risk rating (c.f. 6.1.2), are not specifically considered for monitoring and evaluation during implementation of projects.

### 6.1.2 Conclusion on intergovernmental relations and co-operative governance

The main conclusions regarding inclusion of environmental considerations in DHS documents pertain to the main study goal:

- Many of the environmental impact themes were not considered in the selected samples' design phases and hence did not feature in the development of the settlement. Thus impacts that could have been mitigated were not mitigated, which in some cases leads to environmental impacts (that are greater than mitigated impacts) continuing after construction has been completed, when beneficiaries occupy the settlements, and use environmental resources and generates waste for the duration of the occupation of the settlement. This may have occurred because the planning of sustainable human settlements may not have included a holistic approach to sustainable development and co-operative governance when plans and financial allocations were defined for new housing developments.
- Co-operative governance and intergovernmental relations between different sectors, and spheres, such as relations between the housing development implementing entities and town planning, engineering, environmental departments and the local and provincial human settlement departments were vague, or no proof of such relations exist (or in some cases, indication was obtained that relations are negative, and thus engagement may be avoided). Hence co-operative governance in the planning for sustainable development does not prevail. This has major implications on the final human settlement product delivered due to the impacts that the housing unit, or entire settlement will continue to have on the environment.
- Information or data and project files were not accessible which may be indicative of inadequate relation between different spheres of government and sectors.
- Discrepancies exist between departments when naming of human settlement development projects (e.g. a site or development on the HSS database would have a name that is not traceable by town planning departments and vice versa).

### 6.1.3 Conclusions regarding environmental impacts of human settlements development

Conclusions regarding impacts of human settlements pertain to the first and second evaluation objective:

- Impacts of human settlements development projects on the environment occur across all environmental components of air, water, land, and biodiversity.



- Biodiversity is the environmental impact theme with the most secondary impact themes, all of which have medium to high impact risk ratings, making impacts on biodiversity the theme with the highest risk rating attributed to it.
- Impact themes: biodiversity, land, and water, are the themes in which impacts were identified most frequently, which is indicative that these are the components of the environment that will most likely be affected by human settlement developments in any setting or location.
- The highest risk was indicated for the impact themes: “Biodiversity: fauna & flora”, “Biodiversity: biodiversity”, and “Land: Agriculture”, indicating that, where DHS developments affect the biodiversity of the area, and fauna and flora specifically, or where agricultural land is lost due to development, the risk to the environment is greatest.
- Many impacts related to human activities caused during occupation of the settlements, were not taken into consideration in the planning or development of the settlement; e.g. efficient usage of water and energy (yet these are the impacts that were included in the 2nd ed. EIP. Thus, the contents of the 2nd ed. EIP did not contribute to improved considerations for environmental matters or compliance requirements.

#### 6.1.4 Conclusion on EIP indicators

Conclusions regarding impacts of human settlements pertain to the second evaluation objective:

- 2nd ed. EIP indicators appear to have been written to allow for monitoring and evaluation of impacts and not to monitor and evaluate the intergovernmental relationships that exist (or should exist) between different departments; these are the relations that should be used to facilitate co-operative environmental governance.
- Indicators in the 2nd ed. EIP responds to the NEMA principles of sustainable development in which policies and programmes in the EIP should be evaluated; however contextualisation of the indicators are vague and hence do not provide detail of implementation or for compliance requirements, nor who should ensure implementation, or if indicators are applicable to all developments, therefore the indicators do not get included when settlements are planned or developed.

## 6.2 Recommendations

Recommendations for this study were made based on the requirement to review the effectiveness of the implementation of the 2nd ed. EIP.

### 6.2.1 Recommendations regarding inclusion of environmental considerations in Policies, Plans and Programmes

- Policies, plans and programmes yet to be developed by DHS should include content regarding sustainable human settlement developments that considers impacts on the environment caused by development phases, as well as house occupation phases by the beneficiaries.
- Policies, plans and programmes should not repeat or include extracts from reference documents that contain sustainable development and environmental compliance requirements or specifications, as this would lead to ambiguities as to when impacts or development standards or specifications are compulsory and when others are not.
- Policies, plans, and programmes should refer to the EIP regarding environmental impacts caused by human settlement developments.

### 6.2.2 Recommendations for co-operative governance and intergovernmental relations

- Statements in the 2nd ed. EIP pointing to environmental considerations and related intergovernmental relations that were required to deliver sustainable human settlements should have been contextualised and elaborated on by linking the environmental impacts of developments to the organ of state which supports with the development and implementation of the human settlement (such as water, sanitation, and electricity services).
- There was insufficient consideration of occupation phase impacts in the development of the human settlements, which reveals the importance of inter-governmental relations between different sectors, spheres, and departments. Such relations would contribute to the sustainable development of human settlements. It is therefore recommended that procedures be compiled to indicate what the engagement processes are for human settlement development planning, who the stakeholders are that should be engaged with, and each stakeholder should provide input on what the most sustainable development option would be for their area of expertise.
- Co-operative environmental governance of human settlement development should imply that all organs of state (at all spheres and all sectors) that would be involved in a settlement development (such as human settlement departments, town planners, environmental departments, engineers, architects, and funding agencies, communities) must engage prior to any planning (design or land selection) taking place to ensure cognisance of all envi-

ronmental, as well as social and economic components of sustainable development are considered, and factored into the development plan.

- The distinction of roles and responsibilities of each stakeholder to be included in human settlement development will allow for the designation of a particular department to capture specific data, allowing for improved data capturing processes and efficiencies which will allow for easy access to where documents and reports are to be stored on databases, and allow for improved reporting on environmental co-operative governance. This would also reduce data capturing burdens for departments for aspects that are not included as their core functions.

### 6.2.3 Recommendations for the EIP

- EIP which is to be developed according to the requirements specified in the Guideline document, as amended, which was developed after the development of the 2nd ed. EIP.
- The DHS should consider including reference documents in the EIP which specify how environmental impacts should be considered and reduced and what the design standards are that must be complied with to reduce impacts (e.g. consider the Red book design standards currently being redeveloped by the CSIR). The EIP should not include duplication of standards specifications of reference documents.
- The DHS should consider environmental impacts which are related to human settlements, but are contributed to by other sectors. Some of the aspects that contribute to impacts may be better monitored, evaluated and reported by those departments, and hence should be considered for co-operative governance agreements in terms of collecting data and reporting thereon. This includes current aspects included in the 2nd ed. EIP, such as densification; energy efficiency; water efficiency; access to open/ green space; and disposal of waste and adequate water and sanitation. These aspects fall under various departments and it is acknowledged that DHS does not have sufficient resources to ensure these aspects are taken into consideration. Therefore, relations need to be built between DHS and other sectors and departments such as engineering, town planning and environmental departments to contribute to sustainable development and accurate reporting thereon.
- Indicators included in the EIP which should not be monitored by the DHS, should be removed, such as women and youth employed in environmental positions, or trees planted per unit (the latter aspect may be easier to monitor by parks and recreation departments, who in some cases were responsible for implementation hereof).

- The environmental themes impacted most frequently, and those which constitute the highest risk should be considered as the impact themes which require specific consideration between DHS and DEA (and other organs of state) when defining how impact monitoring, evaluation and reporting mechanisms should be developed to ensure impacts are mitigated.
- Indicators need to be included in the EIP that will allow for the monitoring of co-operative governance and how well structures within government perform and relate to one another.
- Indicators should aim to assist DEA in ensuring co-operative environmental governance is achieved, thus it should indicate, for each environmental theme impacted, with which departments or units of which spheres of government governance structures or agreements will be made to ensure legal environmental compliance.
- Requirements for compliance should be elaborated and defined to allow users and stakeholders to understand what the requirements of the EIP are.

### 6.3 Limitations of the study findings

- Housing and human settlement developments implemented by the Department of Human Settlements, through their various policies, plans, and programmes ultimately provide better living conditions and improve the quality of life for the beneficiaries thereof. This study does not compare the net gain or loss effect to the environment resultant from resettling a beneficiary from an informal settlement or informal house or shelter, into a formal settlement and a built house. Informal settlement dwellers may have more direct impacts on the environment, however may consume less of the resource. For example, informal settlements that do not have access to services would cause direct impacts through direct sewage and waste disposal to land and water bodies; and due to no access to service delivery, would use less water or energy.
- The environmental impacts and risks identified may or may not be inclusive of all potential impacts and risks that may occur as result of human settlement development; hence it is recommended that further studies be conducted on this subject.
- The study evaluated the impacts of human settlement developments were on the environment during the implementation of the 2nd ed. EIP. The study could however not prove that, where considerations for environmental impacts and environmental compliance were evident, that it was so due to the 2nd ed. EIP.

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## Appendix A - Qualitative findings

### Town planning questions

Aspect	Potential report containing content:	Question
<b>Adequate space</b>	Township application	1. What / how is space defined?
<b>Health</b>		2. Is there health facility in surrounding townships?
<b>Waste</b> • <b>Planning for waste</b> • <b>Recycling in the area</b>	Township application	3. The township application document should be circulated to local government, waste management dept. who should comment on it, was this done?
<b>Land use</b>	Township application	4. Was land use considered? 5. Was land rezoned?
<b>Access to Natural Environment</b>	Township application	6. Do plans indicate locality to green / open space?
<b>Access to services:</b> • <b>Food</b>	Township application	7. Do plans indicate location in relation to shops?
<b>Access to services:</b> • <b>Water</b> • <b>Sanitation</b>	Township application / OSR reports (Engineering - water & sanitation)	8. Are records kept of houses without access to clean drinking water 9. Are records kept of houses without access to sanitation
• <b>Electricity</b>	Township application / OSR reports (Engineering - electricity)	10. Are records kept of houses without access to electricity
<b>Densification</b>	Township application	11. How does development change current area densities? (more, same, less, not indicated?)
<b>Title Deeds</b>	Township application	12. Does it indicate nr of title deeds registered?

Environmental questions

Aspect	Potential report containing content:	Question
<b>Any sensitivities?</b>	Environmental Scoping Report EIA/BA	1. Was this done (environmental scoping, EIA or Basic Assessment (BA) to indicate environmental sensitivities in the area)?
<b>Marginal land (slopes, flood plain, rivers)</b>	Environmental Scoping Report	2. Is the settlement built on such land?
		3. Was there any mention of such information prior to housing development?
		4. Did an alternative site have to be sought?
	Geotechnical studies	5. Was this done (geotechnical studies)?
	Environmental Management Programme (EMPr)	6. Was this done (EMPr reports done during the development)?
<b>Environmental Awareness/ education</b>	EMPr (during construction) Other?	7. Was awareness raised / people educated through knowledge sharing?
	Environmental Specialist studies	8. Which of this done (list or discuss specialist studies done)?
<b>Public Participation</b>	EIA, BA	9. Was Public Participation done?
<b>Culture</b>	EIA, BA Social impact report	10. Are Cultural considerations included?
<b>Waste</b>	EMPr	11. Is construction waste mentioned?
<b>Hazardous environment</b>	Scoping EIA / BA	12. Any indication of the site containing / located close to, a hazardous environment?
<b>Unique habitats; Interference with ecological processes</b>	Scoping EIA / BA	13. Do reports indicate control and prevention hereof?
<b>Air pollution</b>	Scoping	14. Was any specific studies done, or is there any mention of ambient air quality?
<b>Air quality</b>	EIA / BA	
<b>Water pollution</b>	Scoping EIA / BA	15. Any specific studies done, or mention of water quality in the area?
	Social impact	16. Nr of water borne diseases in the area?
<b>Electricity</b>	Social impact study	17. Any indication of the affordability of electricity to residents?

Engineering questions

Aspect	Potential report containing content:	Question
<b>Adequate lighting</b>	Engineering: Mechanical Design report (at Detail Design Stage)	1. Are any light aspects included in design? a) electric? b) natural?
<b>Heating &amp; Ventilation</b>	Engineering: Mechanical Design report (at Detail Design Stage)	2. Are any such aspects included in design? a) electric? b) natural?
<b>Adequate infrastructure: Water &amp; Sanitation</b>	Engineering: OSR – details bulk demand and supply, and carry capacity	3. Was this included in any report? 4. Any indication that this was concluded after the development?
<b>Renewables usage</b>	OSR - electricity/energy PDR - electricity/energy	5. Does the PDR specify the renewable sources that will be used, if any? If not, does the OSR mention it should be, or not be considered?
<b>Energy</b>	OSR - electricity PDR - Electricity	6. Any mention of electrical efficiencies? Or does it mention any designs according to, e.g. Red Book / SANS standards / National Building Regulations? 7. Is there specification of estimated energy use? 8. Is there any indication of cost of electricity in the area? 9. Is there any indication of the affordability of electricity to residents?
<b>Water</b>	OSR- water / PDR – Water and sanitation  Social impact study / OSR / PDR?  OSR- water  Cost of water	10. Is there any mention of water efficiencies? Or does it mention any designs according to, e.g. Red Book / SANS standards / National Building Regulations? (3 levels of water pressure services could be indicated : Full, medium, low – which is dictated by class of settlement) 11. Is there indication of the estimated water consumption per day (Litres per person)? 12. Is there any indication of cost of water in the area?
<b>Access to services:</b>	Township application / OSR reports (Engineering - water & sanitation)	13. Are records kept of houses without access to clean drinking water?
• <b>Water</b>		
• <b>Sanitation</b>	Township application / OSR reports (Engineering - water & sanitation)	14. Are records kept of houses without access to sanitation
• <b>Electricity</b>	Township application / OSR reports (Engineering - electricity)	15. Are records kept of houses without access to electricity?

### Human settlements questions

Aspect	Potential report containing content:	Question
Woman workforce	30% of housing budget allocated for woman owned projects	Is this monitored or mentioned anywhere?
Youth & Woman workforce	Of Temporary workers, 60% to be women, and 20% youth	Is this done, and monitored?
Tenure		How / where is types of tenure and security of tenure recorded and updated? Does it record impediments to people owning / inheriting land?
Local Resource Use; waste material used in buildings	Use locally sourced labour, and materials	Does any report specify this requirement?
Urbanisation		Does the report indicate urbanisation rate (in mentioning the need for the development)?
Title Deeds	Nr of title deeds registered annually?	Are details of this project's title deeds recorded?
Densification	% of Medium density housing units developed per annum?	
IDP		Does the IDP have a housing chapter?
Provincial multiyear housing development plan (PHDP)		Is this completed?
	IDP & PHDP	Does the PHDP comply with 10 year IDP
Participation		How are citizens involved in housing planning?
Funding	Municipal housing capital investment?	Is funding received through Human Settlement Development Programme? Do you know this figure as a % of total funding? Is funding received through Public Investment for bulk infrastructure? Do you know this figure as a % of total funding? Level of public investment in informal settlement upgrading? Do you know this figure as a % of total funding?
Trees		Record of number of trees planted with new subsidised houses?
Ceilings		% Of subsidised houses with ceilings built in the year?
Land acquisition		Where are processes documented for proactive identification, acquisition, assessment and release of housing land documented?

### Appendix B – Risk Matrix

#### Ranking of evaluation criteria

Description of the Severity	Risk Rating	Step 1: Add together the ratings from each of the "Consequence" categories (Severity, Spatial extent, and duration).
Impacts affect the environmental in such a way that natural, cultural and/or social functions and processes are not affected.	1	
Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	2	
Natural, cultural and social functions and processes are altered to extent that they temporarily cease	3	
Natural, cultural and social functions and processes are altered to extent that they permanently cease	4	
Description of the Spatial Extent	Risk Rating	
Impact occurs on-site	1	
Impact occurs within 5km radius of the site	2	
Impact occurs within a 100km radius of the site	3	
Impact occurs within South Africa	4	
Description of the Duration	Risk Rating	
The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase	1	
The impact will last for the period of the construction phase, where after it will be entirely negated	2	
The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	3	
Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	4	
Description of the Probability	Risk Rating	Step 2: Add the "Likelihood" (probability) rating to the "Consequence" rating.
The possibility of the impact materializing is very low either because of design or historic experience.	1	
There is a distinct possibility that the impact will occur.	2	
It is most likely that the impact will occur.	3	
The impact will certainly occur	4	

Risk consequence and likelihood

LIKELIHOOD	CONSEQUENCE (Severity + Duration + Spatial)												
	1	2	3	4	5	6	7	8	9	10	11	12	
	1	2	3	4	5	6	7	8	9	10	11	12	13
	2	3	4	5	6	7	8	9	10	11	12	13	14
	3	4	5	6	7	8	9	10	11	12	13	14	15
4	5	6	7	8	9	10	11	12	13	14	15	16	
<p>The significance of impacts is determined based on the evaluation of an activity's impact in terms of consequence and likelihood. Using the sum of the evaluated ranking, the overall significance can be classified as follows:</p> <ul style="list-style-type: none"> <li>Where it will not have a significant influence on the environment. Management measures can be proposed to ensure that significance does not increase</li> <li>Where it could have a significant influence on the environment unless it is mitigated or managed</li> <li>Where it would have a significant influence on the environment regardless of any possible mitigation and hence must be either avoided or managed</li> </ul>				<p>Category Min (&gt;=)</p>	<p>Category Max (&lt;)</p>	<p>Risk rating</p>							
				4	7	Low	1						
				8	11	Medium	2						
				12	16	High	3						

