Cape Peninsula
University of Technology

EFFICIENCY OF ENVIRONMENTAL LEGISLATION TO PROTECT THE ENVIRONMENT ASSOCIATED WITH FINE ASH DAMS IN SECUNDA, MPUMALANGA, SOUTH AFRICA

by

BRONISLAWA FRANZISKA VAN DER MEER

Dissertation submitted in partial fulfilment of the requirements for the degree

Master of Environmental Management (MGEVMC): Environmental and Occupational Studies

in the Faculty of Applied Sciences

at the Cape Peninsula University of Technology

Supervisor: Doctor N Malaza

Cape Town
28 February 2021

DECLARATION

I, Bronislawa Franziska van der Meer, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology or of Sasol Pty LTD.

Signed

Date

ABSTRACT

This study aimed to unpack applicable environmental acts and regulations relevant to the governance of the Sasol Secunda Industrial Complex (SSIC) Fine Ash Dam 6 (FAD6) facility situated in the Mpumalanga province of South Africa. The case study entailed the following:

- Legislative review to establish efficiency in the prevention of over-regulation, specifically as it pertains to the FAD 6 facility and in a broader sense as it reflects in South Africa;
- A desk-top study and literature review of the licenses, authorisations and management plans issued for the governance of the FAD6 facility; and
- Semi-structured interviews with regulatory case officers, Sasol specialist and various environmental assessment practitioners (EAPs) / consultants in order to establish understanding around inter-governmental communication for dispensation consideration if applicable.

Seven documents were evaluated for the FAD6 facility at SSIC including an Environmental Authorisation, Water Use License, Waste Management License, Environmental Management Plan for the WML, Amendment to the Environmental Management Plan, Environmental Management Plan for the General Authorisation and a General Authorisations.

It was established that the governance structures in South Africa are complicated by two different bodies. Environmental governance structures in South Africa consists of the Department of Environment, Forestry and Fisheries (DEFF) and Department of Water Affairs (DWS), both forming part of the Economic Services and Infrastructure Development cluster within National Government (National Government of South Africa, n.d.). The DWS is managed according to catchment areas that crosses provincial boundaries, while DEFF is managed on national, provincial and local level. While these departments have robust legislation in terms of co-operative governance, there appears to still be a lot of duplication as a result of how these departments interact to effectively manage and govern in order to protect the natural environment. Various interactions between governing bodies showed that while DEFF consults both inter-departmentally, they also consulted with the DWS for inputs related to the protection of water resources. The DWS however does not consult with DEFF for inputs related to water matters. The study concluded that there is definite duplication between the conditions from various departments. It was not possible to give an exact numerical figure for the duplication of any specific condition that was required, however, it was evident that there are various conditions across the different categories (highlighted throughout the study) that had similar intent in terms of the protection of the environment.

The main outcome of the study showed that there is a definite propensity to over-regulate due to some inefficiencies in the application of environmental legislation.

DEDICATION

I wish to thank:

Peter van der Meer, my loving husband, for encouraging me to do this and for your patience and support.

ACKNOWLEDGEMENTS

I wish to thank:

- Sasol Limited for allowing me to use fine ash dam 6, at the Sasol Secunda Industrial Complex, as a case study for assessing the efficiency of environmental legislation in the protection of the environment in South Africa.
- Dr Ntokozo Malaza, my supervisor, for your patience and guidance.
- Mr Timothy Ndlovu, facility operations manager, for peer review and guidance.
- Ms Freda-Jean Meltz, colleague, friend and patient teacher of software.

GLOSSARY

Acronyms and Abbreviations	Description
CAE	Clear Ash Effluent
CMA(s)	Catchment Management Agency(ies)
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DEA	Department of Environmental Affairs
DEDEAT	Department of Economic Development, Environment and Tourism
DEFF	Department of Environment, Forestry and Fisheries
DWS	Department of Water and Sanitation
EA(s)	Environmental Authorisation(s)
EIA(s)	Environmental Impact Assessment(s)
EIP	Environmental Implementation Plan
EMP(s)	Environmental Management Plan(s)
FAD(x)	Fine Ash Dam (x)
GA(s)	General Authorisation(s)
GNR	Government Notice Regulation
ISO	International Organization for Standardization

IWWMP	Sasol Integrated Water and Waste Management Plan
MAR	Mean Annual Runoff
MDARDLEA	Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
RoD	Record of Decision
RWD(s)	Return Water Dam(s)
SAHRA	South African Heritage Resource Agency
SCO	Secunda Chemical Operations
SEA	Strategic Environmental Assessment
SSIC	Sasol Secunda Industrial Complex
SSO	Secunda Synfuels Operations
VRCMA	Vaal River Catchment Management Agency
WADS	Waste Ash Disposal Site
WAS	Waste Ash Site

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

1.1 Introduction

Regulation or over-regulation? In order to evaluate the efficiency of the South African legislation in the regulation of fine ash dams, this research of the fine ash dam 6 (FAD6) facility at the Sasol Secunda Industrial Complex (SSIC) in the Mpumalanga province of South Africa, aims to unpack applicable legislation, the application and governance of the legislation and its ability to efficiently protect the environment. This case study will evaluate the applicable legislation and the various authorizations, management plans, licenses and permits issued for the FAD6 to establish efficiency in the prevention of over-regulation, specifically as it pertains to the facility and in a broader sense as it reflects in South Africa. The FAD6 facility at SSIC has an Environmental Authorisation, Environmental Management Plan, Water Use License, Waste Management License, Environmental Management Program, two General Authorisations and the facility is subject to requirements set out in the Sasol Secunda Integrated Water and Waste Management Plan (IWWMP), which is updated and submitted to DWS on an annual basis.

1.2 Research Statement

Economic development in South Africa is an ongoing process. Ensuring sustainable development while minimizing the impact of business on the natural environment is a constitutional right. Legislative changes over the last two decades has made serious ingress into setting up an infrastructure for the protection of the environment while ensuring positive growth of the economy. The focus for protection of the environment has shifted from a more general intent to very specific and specialized areas of expertise breaking it down to the protection of aspects such as air, water, waste, land and biodiversity. This study aims to unpack applicable acts and regulations relevant to the governance of fine ash dams using the Sasol Secunda Fine Ash Dam 6 (FAD6) facility, situated in the Mpumalanga province of South Africa, for the evaluation. The case study entails a review of the licenses and authorisations issued for the governance of the FAD6 facility in order to establish a case of over-regulation, specifically as it pertains to the facility and in a broader sense as it reflects in South Africa

1.3 Research Questions

- How does governing bodies communicate and interact at the various levels to ensure the effective protection of the environment, without over regulation?
- What percentage (%) duplication occurs across the various authorisations and licenses that were issued to the FAD6 facility at the Sasol Industrial Complex in Secunda?
- What allowances are made in legislation to ensure efficient governance and does this effectively prevent over regulation?

1.4 Location of the study area

The study location is the FAD6 facility situated within the Sasol Secunda Industrial Complex (SSIC). The SSIC is located in the Govan Mbeki Local Municipality, that forms part of the Gert Sibande District Municipality and in turn falls to the Highveld Ridge Magisterial District of the Mpumalanga province of South Africa. The SSIC complex is located to the south-west of the town of Secunda and east-south-east of the town of Embalenhle (

Figure 1.1). The facility is bordered, on the Embalenhle side, by the regional road R548 which is the road running between the towns of Kinross and Charl Cilliers. The southern and eastern sides of the facility include the Brandspruit Colliery, a Quarry dam and farm land. FAD6 forms part of the Outside Ash facility at the SSIC. The Outside Ash area is located to the south west of the primary operational area. The fine ash is transported from the Inside Ash areas using fine ash slurry transfer lines.

The Secunda Synfuels Operations applied for environmental authorisation to construct and operate a 6th fine ash dam as the life expectancy of the existing fine ash dam number 4 (FAD4) was nearing end of life and also to provide additional storage capacity for when fine ash dam number 5 (FAD5) reaches capacity. Authorisation for the construction of FAD6 was received on 08 October 2012. The site coordinates are: 26° 5613'S and 29° 1602'E. Fine Ash Dam 6 spans over the following farm portions:

- Rietvley 320IS: 0, 2, 3, 7, 8, 9, 10 and 20;
- Middelbult 284IS: 5;
- Twistdraai 285IS: 4, 6, 7, and 10; and
- Secunda Ext 35 Portion 0 Erf 8488.

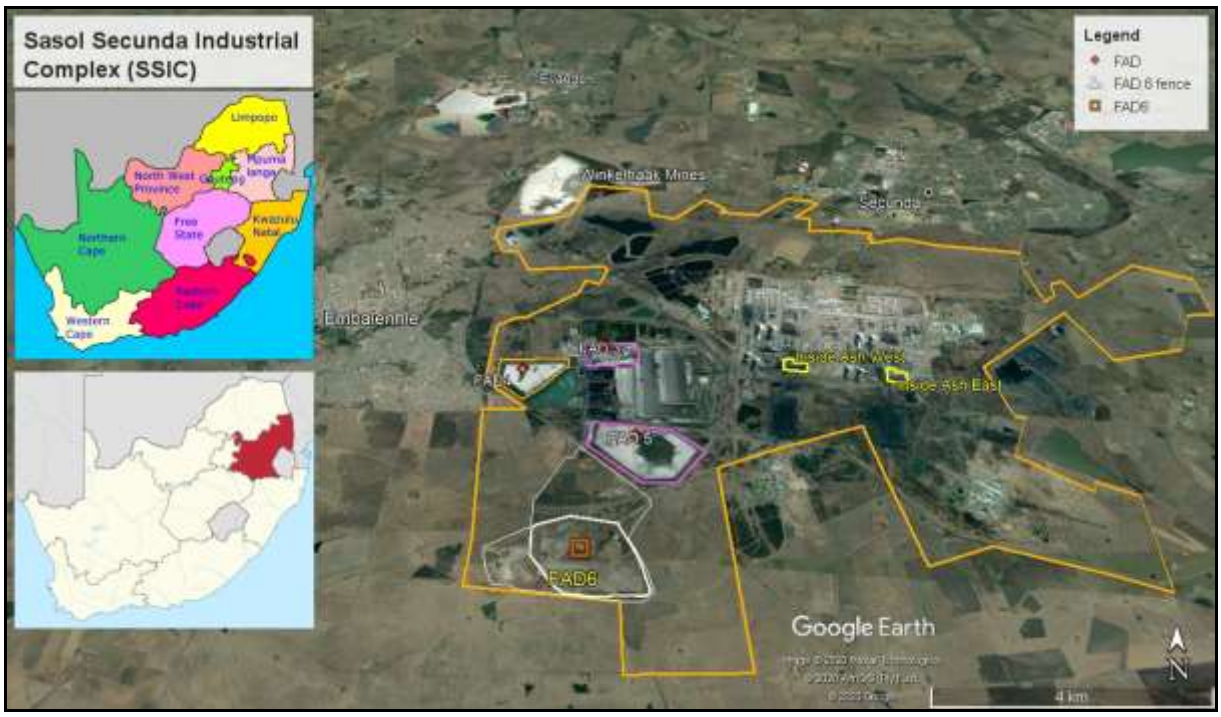


Figure 1.1: Google Location Map - SSIC Facility in the town of Secunda, Mpumalanga Province (Modified and redrawn from Google Earth, (2020).

1.5 Fine Ash Dam 6 infrastructure

FADs are conventional residue dams, equipped with penstocks. The ash is transported to the FAD via ash slurry lines using clear ash effluent (CAE) as transport medium. The ash settles on the FAD, and the CAE decant via penstocks to respective return water dams (RWDs). FADs, and specifically FAD6, includes various infrastructure as shown in Figure 1.2.

- Pumps and a fine ash slurry line is used to pump fine ash from the Inside Ash to the Outside Ash facility for deposition at FAD6, using secondary quality process water stream as transport medium.
- Additional pumps are used to deposit the ash slurry onto the top of the FAD where it runs from the outside toward the centre of the dam.
- A penstock is used to decant the water while the ash settles in the dam to form the dam walls.
- From the penstocks, the return water runs along water canals from the bottom of the FAD to one Return Water Dams (RWDs) – west.
- Silt traps are installed upstream of both the RWDs to minimize silting in the RWDs.
- A network of pipelines and canals connecting FAD6 and the RWDs to various pump stations, valve boxes, CAE systems and process water dams.

- The facility infrastructure further includes a network for access roads between the various Outside Ash sites as well as a bridge over the R546, a perimeter road around FAD6 and a security road along the FAD6 boundary fence.
- A sub-station(s) and power lines to ensure provision of electricity to pump stations, valve boxes, instrumentation, the ablution facility and to allow work.

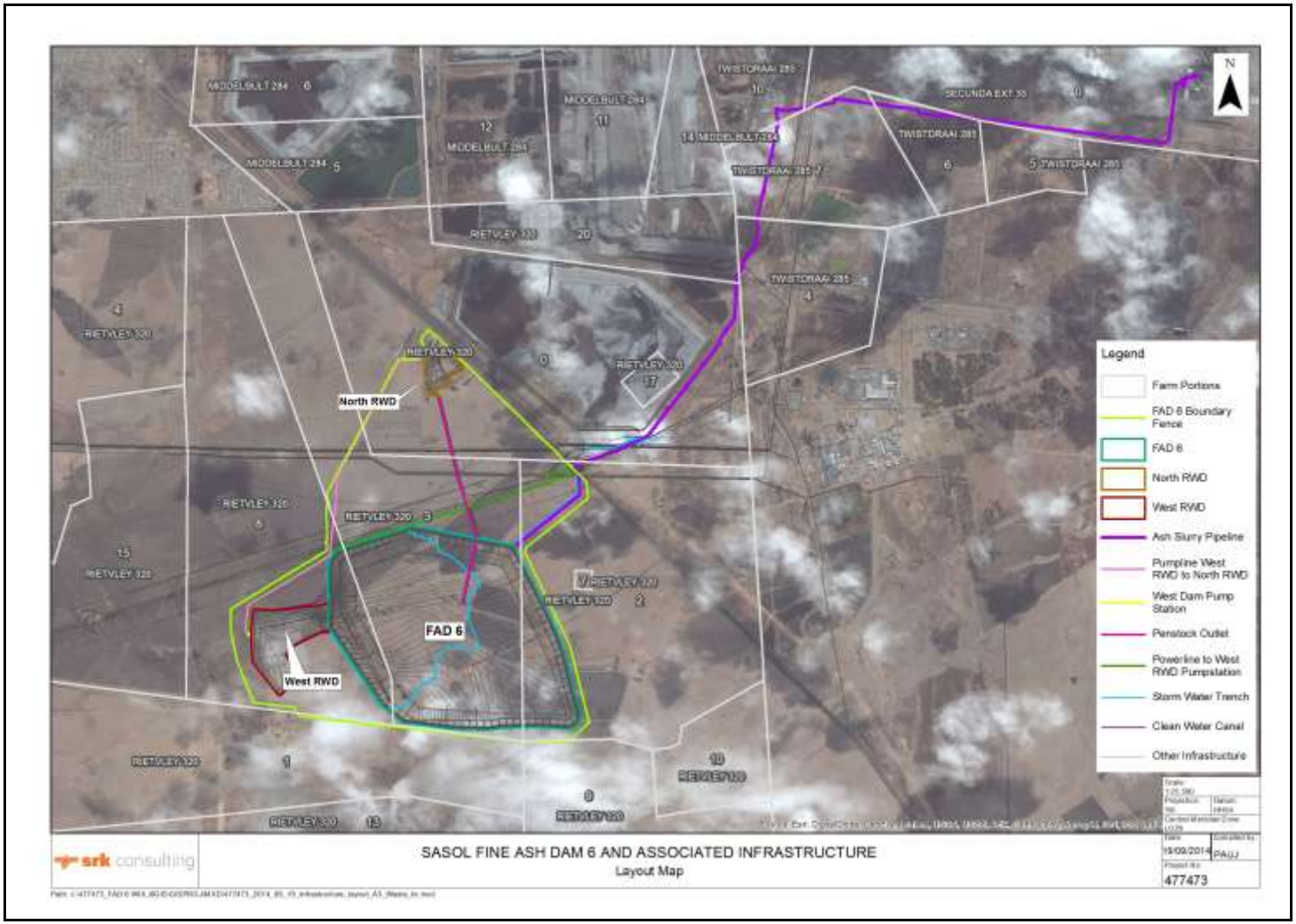


Figure 1.2: Sasol FAD6 and associated infrastructure (SRK, 2012).

1.6 Fine Ash Dam 6 operation

The Final Environmental Impact Assessment Report and Environmental Management Plan for the proposed Fine Ash Dam 6 (FAD 6) at Sasol Synfuels (Pty) Ltd in the Mpumalanga Province, prepared and issued by SRK consulting (report number 421219/ Final EIA / EMP) in July 2012 in preparation for the construction of the FAD6, outlines the process very well in section 4.5 of the report. The ash deposition process is depicted in Figure 1.3 below.

The SSIC plant takes in coal and through the Gasification processes recovers chemicals and fuels. The facility also uses coal to produce steam for operational purposes. Both these processes result in ash as a waste product. The ash produced from both these processes is transported to the inside ash handling facilities, on the east and west sides of the factory, using a water slurry stream. The ash streams are combined and treated by passing them over a set of screens that further separates the course ash particles from the ash slurry. The coarse ash is disposed of on existing ash heaps and the finer particles are deposited in a gravity thickener. Most of the water is removed as a clear overflow and is re-used as a transport medium for the ash. The fine ash slurry, settled out of this process, is pumped to the FADs in the Outside Ash facilities.

The FAD6 facility has two permanent penstock towers that run down the centre of the dam. Ash slurry is pumped toward the outside, at the top of the dam, from where it runs toward the inside. The fine ash deposits onto the dam floor while the water is decanted through the centre of the penstock. The penstock connects to a series of pipelines that serves to remove the water from the dam. The water now flows towards the RWDs and is gravity fed to a containment pond. This water is pumped back to the SSIC complex for treatment. Treatment includes desalination so that the water quality is suitable for boiler feed water. The FAD is equipped with a seepage system for collection of water if seepage occurs.

FAD6 is operated in line with the paddocking method. This means that ash deposits are rotated in such a way that they form walls that are raised mechanically using excavators. Layers of 100 to 150mm of fine ash is deposited in the paddock and after it has settled, the additional water is drained to the centre of the pool. After a drying period, the paddock walls are raised again. This cycle is repeated to create paddocks around the outside of the dam. This system systematically builds the perimeter to form the day wall. Fine ash deposits are alternated through the paddocks in various cycles and this is how the dam wall is raised. It is

important to allow sufficient drying, evaporation and draining of the layers before placing the next layer. Fine ash not used for building of the wall is deposited on the dam floor.

In the paddocking method, the building of walls is done only during daylight to ensure an added safety component. The dam wall provides a freeboard to the dam.

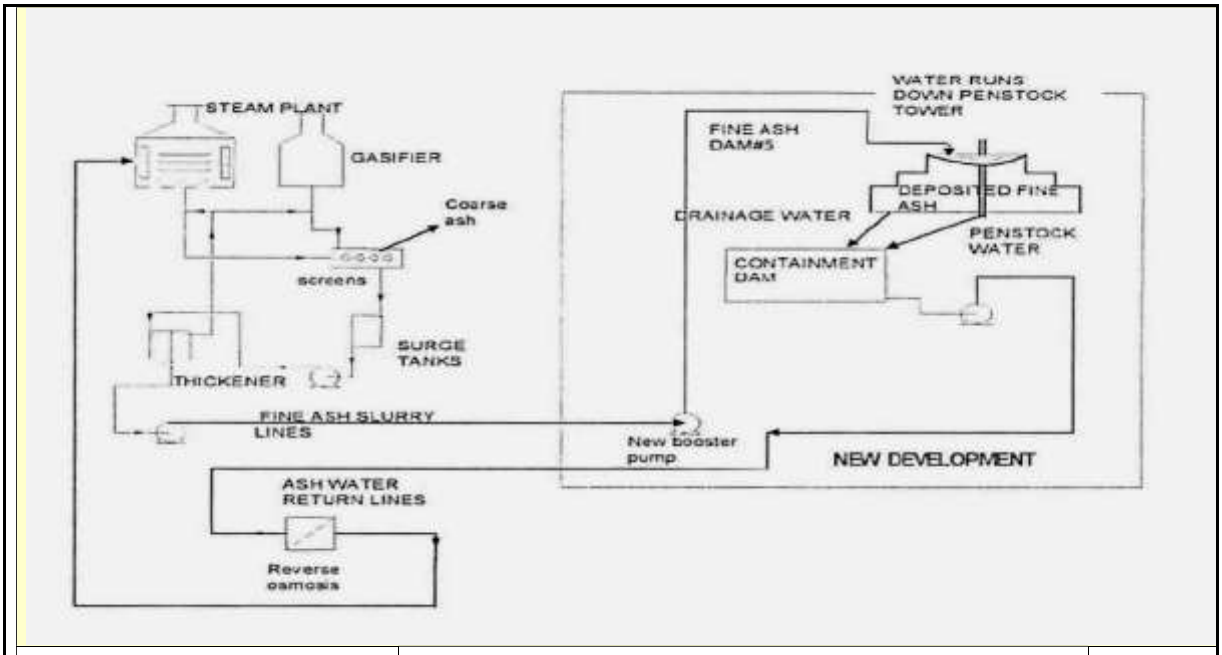


Figure 1.3: Ash formulation and deposition process (SRK, 2012).

1.7 Aims and Objectives

The aim of the study is to evaluate the efficiency of environmental governance in the protection of the natural environment, with specific emphasis on the regulations applicable to FAD6. For this purpose, the specific objectives of the study are:

- To establish the role of the various governance structures in South Africa and how they interact to effectively manage and govern on national, provincial and local level.
- To unpack all authorisations and licenses applicable to the Sasol Secunda FAD6 facility as they relate to the various governing authorities.
- To evaluate and establish duplication between authorisations and licenses issued for FAD6 facility at the SIC in Secunda.

1.8 Significance of the Research

The protection of the environment is a constitutional right. The constitution is enacted through various legislation which in turn issue regulation to ensure that the environment is protected. It is not the intent of the legislature to burden industry to the extent that they cannot sustainably contribute to the economy. This research intends to evaluate the extent of over-regulation through evaluation of the efficiency of environmental governance in the protection of the natural environment. It is significant as efficiency will ensure equilibrium and balance and if there is over-regulation, it will create opportunity for further research to determine potential mechanisms to alleviate the burden on both the government and industry to become more efficient in the protection of the natural environment. This will ultimately inform efficiency into the enactment and regulation as they pertain to the protection of the environment.

1.9 Delineation of the Research

The research scope applies specifically to the Sasol Secunda Industrial Complex FAD6 facility that falls within the Mpumalanga province of South Africa and to the national, provincial and local government departments and framework that influence the governance of the facility. It therefore applies to all governance departments within the framework of the:

- Department of Water and Sanitation (DWS).
- Department of Environment, Forestry and Fisheries (DEFF).

The research will focus on the evaluation of the following governance documents issued within the above frameworks and as applicable to the FAD6 facility at Sasol SIC:

- Environmental Authorisation (EA) 17/2/3 GS-6 as Amended.
- Environmental Management Plan (EMP) under the EA.
- SAHRA Permit 2057.
- Water Use License 01/C12D/CGI/4076.
- Waste Management License for FAD-6 12/9/11/L45369/6.
- Amended Environmental Management Programme under the Waste Management License.
- General Authorisation (GA) 509 of 26 August 2016 for additional infrastructure and powerlines.
- General Authorisation (GA) 509 of 26 August 2016 for power line associated with FAD6.
- New Environmental Management Programme (EMPr) compiled by SRK Consulting dated June 2016.

The dissertation is outlined as follows:

Chapter 1: Introduction: gives a general introduction to the Efficiency of Environmental Legislation to protect the environment associated with fine ash dams in Secunda, Mpumalanga, South Africa.
Chapter 2: Background and Literature Review: A brief background to the study is outlined and the literature review regarding reasonable legislative measures is discussed.
Chapter 3: Research Design and Methodology: the research design is a qualitative study of all licenses and authorisations issued to the study site. Comprehensive literature review predominantly consists of:

- Existing legislative bodies / structures and their governance roles and workings.
- Dispensation options and the implementation thereof, within relevant environmental legislation, to prevent over-regulation while efficiently and effectively protecting the environment.

Chapter 4: Results and Discussion: Results are displayed and discussed.
Chapter 5: Conclusion and Recommendations
Bibliography/References
Appendices

1.10 Expected outcomes, results and contributions of the Research

The research has shown the level of interaction between governing bodies at the various levels in ensuring effective protection of the environment, without over regulation. In other words, it evaluated the allowances made in legislation to ensure efficient governance and established the effectiveness of such allowances in preventing over-regulation.

The results showed the percentage (%) duplication across the various authorisations and licenses issued to the FAD6 facility at the Sasol Industrial Complex in Secunda.

This research provided a basis for further evaluation for efficient governance around environmental protection without over-regulation by evaluating the application of governance requirements at every phase of an industrial development including construction, operation and closure / rehabilitation phases.

CHAPTER 2: BACKGROUND AND LITERATURE REVIEW

2.1 Introduction

Sasol is an integrated Chemicals and Energy Company started in the early 1950s and today operates in 32 countries globally to produce a wide range of liquid fuels and chemicals. The Sasol Group comprises various upstream business units and operating hubs and is supported by functional units to ensure sustainable business function. Sasol utilizes natural resources including coal, crude oil, natural gas and water and therefor has an unavoidable impact on the environment.

Sasol's Secunda Synfuels Operations (SSO) and Secunda Chemical Operations (SCO) falls within the Govan Mbeki Municipality that form part of the Gert Sibande District and is situated in the Mpumalanga province of South Africa. SSO converts coal and gas to liquid through the gasification process and also generates energy at the steam plant. Both these processes produce ash as one of various waste streams.

SSO currently have six fine ash dams of which two are in operation. In 2012 SSO applied for environmental authorisation to construct and operate a 6th fine ash dam as the life expectancy of fine ash dam number 4 (FAD4) was nearing end of life and also to provide additional storage capacity for when fine ash dam number 5 (FAD5) reaches capacity. At the time of this study, the facility is operating two active FADs.

FADs are conventional residue dams, equipped with penstocks. The ash is transported to the FAD via ash slurry lines using process water as transport medium. The ash settles on the FAD, and the water decant via penstocks to respective return water dams (RWDs). The Sasol Secunda complex has a life expectancy of at least another 25 years, which means that there is a requirement to store the fine ash produced from the coal gasification and boiler operations until approximately 2050.

The Fine Ash Dam 6 (FAD6) facility that will be the focus of this study was constructed to the south and west of the existing fine ash disposal facilities. The fine ash slurry deposited in FAD6 has been classified as a Type 3 waste and FAD6 has therefore been designed as a Class 'C' waste management facility. The facility was constructed as an extension of the existing authorised Synfuels Waste Ash Disposal Facility (WADS) located within the wider Sasol Synfuels Industrial Complex (SIC). FAD6 is lined with a composite clay and geomembrane liner. Phase 1 of the facility, currently in operation, covers an area of 175

hectares and is served by a return water dam as well as associated infrastructure including penstocks, pipelines, canals, a pump station, ablution facility, substations, roads, fencing and wetland crossings. FAD6 was commissioned in May 2019 as the current FAD facilities are nearing full capacity.

The FAD6 facility at SSIC currently holds an Environmental Authorisation (EA), Environmental Management Plan (EMP), Water Use License (WUL), Waste Management License (WMP), Environmental Management Program (EMPr), two General Authorisations (GAs) and a South African Heritage Resource Agency (SAHRA) permit. In addition to this, the FAD6 facility is subject to requirements set out in the Sasol Secunda Integrated Water and Waste Management Plan (IWWMP), which includes an action plan that is updated and submitted to DWS on an annual basis.

Sasol's SSO has ISO 14001:2015 certification, which means that the facility complies with, and is accredited to, the requirements of the Environmental Management System as set out by the International Organization for Standardization.

2.2 Literature review

Section 24 of the South African constitution states that: "Everyone has the right—
(a) to an environment that is not harmful to their health or wellbeing; and
(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—
(i) prevent pollution and ecological degradation;
(ii) promote conservation; and
(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development" (South Africa, 1996).

This project will focus on the part of that powerful statement related to "reasonable legislative" measures. The South African environmental law is legislated and regulated at national, provincial and local levels and includes all aspect related to the natural environment. Governance is cooperative and therefor also includes advisory bodies drawn from traditional leaders that advises on both national and provincial level. The governance structure is complex and overlaps around various aspects. The main regulation aspects that will be focused on here relates to air, water, waste, land and biodiversity.

Section 22(3) of the National Water Act (Department of Water and Sanitation, 1998) allows for dispensation of licensing if there is sufficient evidence that the intent of the act is met in a licence or permit already issued under any other law. A waste management license was already issued for the FAD6 facility, by the Department of Environmental Affairs (DEA)[1], on 29 October 2015 by the Deputy Director General: Chemicals and Waste Management.

General Authorisation are intent on replacing the need for a water user to apply for a licence in terms of the National Water Act (Act 36 of 1998), provided that the water use is within the limits and conditions of this General Authorisation. The FAD6 facility has a water use license and two general authorisations for additional infrastructure and powerlines and power lines associated with the facility.

The Environmental Authorisation (EA) 17/2/3 GS-6 as Amended, issued by Provincial Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), on 10 October 2012, was issued for the undertaking of "*The proposed construction of fine ash dam to be known as dam 6 at Sasol Secunda on the remainder of portion 2 and 3 and on portions 8, 9 and 1O of the farm Rietvley 320 IS within the jurisdiction of Govan Mbeki Local Municipality, Mpumalanga Province*." This EA was issued for the construction of the dam, but includes very specific conditions related to the management, commissioning and operation of FAD6. The Environmental Management Plan (EMP) under the EA[2], approved by Provincial Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), was purposed for effective management of construction, operation and closure phases of the FAD6 facility and its associated infrastructure. The management plan is very detailed regarding the management and monitoring of socio-economic, surface water, geohydrology, waste management, air quality management, topography, cultural and heritage, noise, soils, land capability and use, biodiversity, wetlands, traffic, geology as well as health and safety requirements during various phases of the lifespan of the facility. These aspects are captured in the monitoring plan as well as in the licenses and the authorisation.

The Sasol South African operations have shown commitment to minimizing environmental impacts and deal with environmental challenges by conducting environmental impact assessments (EIAs), seeking environmental authorizations (EAs), introducing environmental management plans (EMPs) and securing licenses to operate. Sasol has an integrated

[1] The Department of Environment, Forestry and Fisheries (DEFF) was formerly known as the Department of Environmental Affairs (DEA)
[2] Environmental Authorizations are issued under the Environmental Impact Assessment Regulations

environmental management approach for minimizing the company environmental footprint sustainably (Figure 2.1).

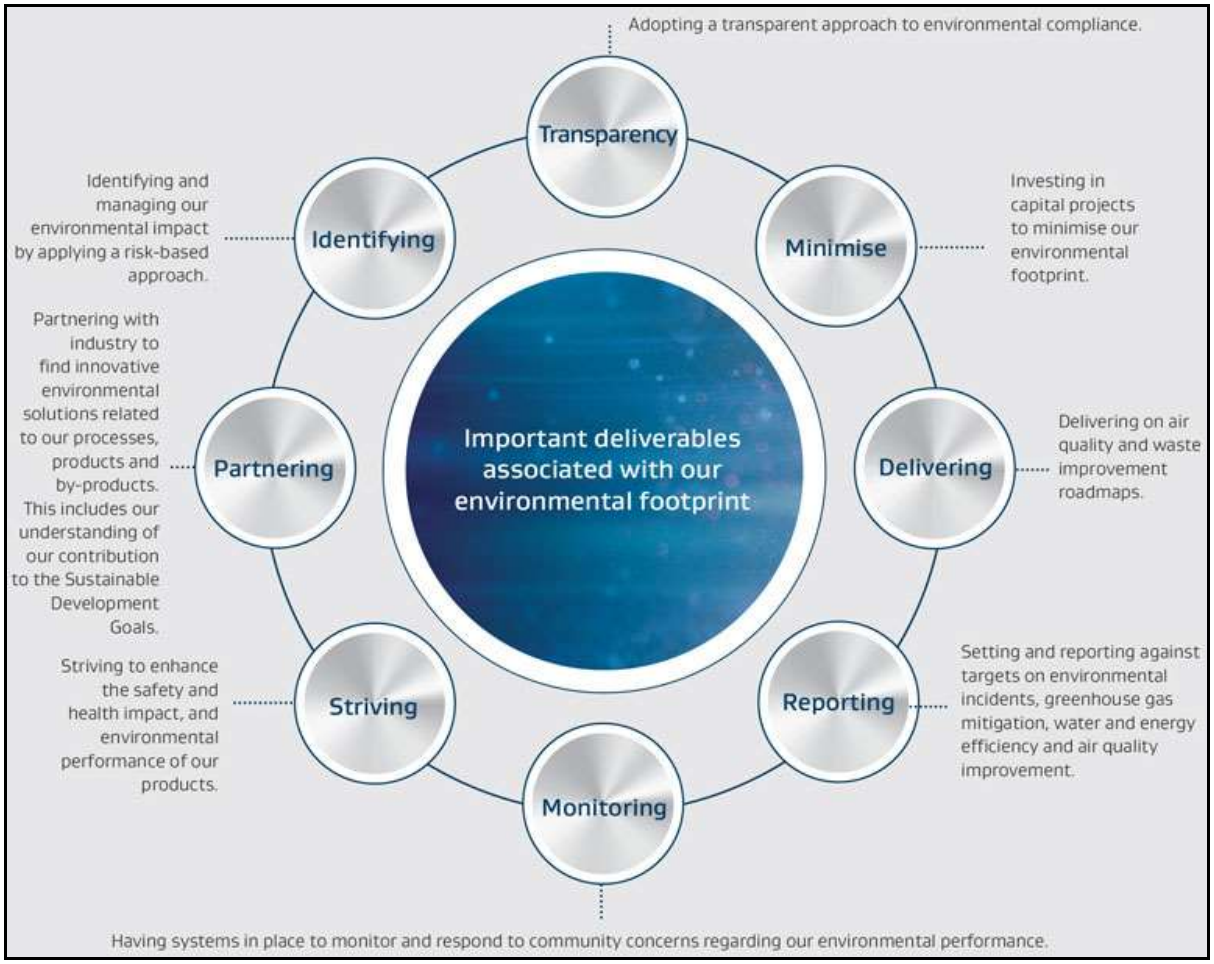


Figure 2.1: Sasol integrated environmental management approach (Sasol Limited, 2018).

The FAD6 facility at the Secunda site currently holds the following authorisations and licenses:

- Environmental Authorisation (EA) 17/2/3 GS-6 as Amended, issued by Provincial Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA).
- Environmental Management Plan (EMP) under the EA, approved by Provincial Department of Economic Development, Environment and Tourism (DEDEAT).
- SAHRA Permit 2057, issued by National South African Heritage Resource Agency (SAHRA).
- Water Use License 01/C12D/CGI/4076, issued by National Department of Water and Sanitation (DWS).
- Waste Management License for FAD-6 12/9/11/L45369/6, issued by the National Department of Environmental Affairs (DEA), now the Department of Environment, Forestry and Fisheries (DEFF).

- Amended Environmental Management Programme under the Waste Management License.
- General Authorisation (GA) 509 of 26 August 2016 for additional infrastructure and powerlines, issued by Department of Water and Sanitation (DWS).
- General Authorisation (GA) 509 of 26 August 2016 for power line associated with FAD6, issued by Department of Water and Sanitation (DWS).
- New Environmental Management Programme (EMPr) compiled by SRK Consulting dated June 2016, for additional infrastructure and powerlines.

The FAD6 facility at SSIC therefore has an EA, EMP, WUL, WML, EMPr, two GAs and SAHRA permit. In addition to this, the FAD6 facility is subject to requirements set out in the Sasol Secunda Integrated Water and Waste Management Plan (IWWMP), which includes an action plan that is updated and submitted to DWS on an annual basis.

ISO 14001:2015 is a voluntary framework for a sustainable approach to an environmental management system that protects the environment and balances environmental conditions with socio-economic requirements (International Organization for Standardization, 2015). SSO received their latest ISO 14001:2015 certification in September 2018 and it is valid until September 2021. ISO certification means that the facility complies with, and is accredited to, the requirements of the Environmental Management System as set out by the International Organization for Standardization. A study around the improvement of environmental performance through the implementation of voluntary environmental management systems (EMSs) in Kenya, concluded that adoption of EMSs does lead to better environmental performance (Mungai et al., 2020). The consolidated post-audit report, after completion of independent audits of the SSIC EAs and EMPs (WSP, 2019), labelled the facility's compliance with the ISO 14001 standards, licenced and authorised environmental conditions "effective" in mitigating against gaps in its environmental management plans and in the identification of new environmental impacts and risks.

The Environmental Management Framework Regulation, 2010, was created to lend support during the environmental impact assessment process. It is used by competent authorities in decision making when reviewing applications. They provide a lot of information, maps and geographical details, but they are not binding on all decisions at all levels of authority. They are intended to guide applicants to areas appropriate for development, and facilitates co-operative governance by identifying responsibility, recommending mechanisms that will address the needs of the relevant authority and guides and informs decision making. The EMF was designed to support informed and integrated decision making, contribute to

sustainable environmental development, support the EIA process and the delineation of geographical areas for development.

2.2.1 Legal and Policy Framework and Governance Structures

There are various instruments initiated by National, Provincial and Local government that are applicable to the management and operation of FAD6. These instruments are summarised in Table 2.1 below. This study will focus on those related to the auditable requirements as specified in the licenses, authorisations, management plans and permits issued for the operational phase of FAD6 and specifically as they relate to the air, water, waste, land and biodiversity receptors. The FAD6 facility is governed by various departments at various levels.

Table 2.1: Governance for the operation and management of FAD6.

Government Department	Issued	Act / Regulation / Authorisation / License	Issued for FAD6	By	Issued	Reference number
South Africa	1996	*The Constitution of South Africa*	Section 24 of the South African constitution			
Department of Water and Sanitation	1998	*National Water Amendment Act, No. 36 of 1998*	Water Use License in terms of Chapter 4 of the National Water Act, 1998 (Act No. 36 OF 1998)	Department of Water and Sanitation	2016	01/C12D/CGI/4076
Department of Water and Sanitation	2016	*GN 509 of 26 August 2016: General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in section 21(c) or section 21(i)*	Fine Ash Dam (FAD 6) additional infrastructure - Risk Assessment for General Authorisation	DWS: Vaal Proto Catchment Management Agency	2016	16/2/7/C121/B028
Department of Water and Sanitation	2016	*GN 509 of 26 August 2016: General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in section 21(c) or section 21(i)*	Registration of water use in terms of section 39 of the National Water Act, No 36 of 1998: Sasol South Africa (PTY) Ltd: Power line associated with the Sasol FAD 6	DWS: Gauteng Provincial Operation	2018	27/2/2/C42/14/1
Department of Environmental Affairs	1998	*National Environmental Management Act, No. 107 of 1998*				
Department of Environmental Affairs	2010	*GNR 1159 of 10 December 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Amendments to Environmental Impact Assessment Regulations, 2010 and Listing Notices*	Environmental Authorisation for the proposed construction of Fine Ash Dam 6 at Sasol Secunda on the remainder of portion 2 and 3 and on portions 8, 9 and 10 of the Farm Rietvley 320 is within the jurisdiction of Govan Mbeki Local Municipality - Mpumalanga Province	Department of Economic Development, Environment and Tourism	2012	17/2/3 GS-6
Department of Environmental Affairs	2010	*GNR 1159 of 10 December 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Amendments to Environmental Impact Assessment Regulations, 2010 and Listing Notices*	Approved Environmental Management Plan in support of Environmental Authorisation for the proposed construction of Fine Ash Dam 6 at Sasol Secunda on the remainder of portion 2 and 3 and on portions 8, 9 and 10 of the Farm Rietvley 320 is within the jurisdiction of Govan Mbeki Local Municipality - Mpumalanga Province	Department of Economic Development, Environment and Tourism	2012	17/2/3 GS-6
Department of Environmental Affairs	2010	*GNR 1159 of 10 December 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Amendments to Environmental Impact Assessment Regulations, 2010 and Listing Notices*	Amendment of Environmental Management Programme (EMPr) for the proposed Sasol South Africa (Pty) Ltd Fine Ash Dam 6 (FAD 6) in Secunda, Govan Mbeki Local Municipality: Mpumalanga Province	Department of Agriculture, Rural Development, Land and Environmental Affairs	2015	1/3/1/16/5 G-01
Department of Environmental Affairs	2010	*GNR 544 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 1: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D*	Based on sections 9,10, 11, 12, 18, 22, 28, 37 and 56			
Department of Environment, Forestry and Fisheries	2010	*GNR 545 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 2: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D*	Based on sections 5,10, 15, 18 and 19			
Department of Environment, Forestry and Fisheries	2008	*National Environmental Management: Waste Management Act, No. 59 of 2008*				
Department of Environmental Affairs	2013	*GN 921 of 29 November 2013: National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008), List of waste management activities that have, or are likely to have, a detrimental effect on the environment*	Waste Management License in terms of section 49(1)(a) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	Department of Environmental Affairs	2019	12/9/11/L180410154620/6

2.2.2 Impacts of the whole FAD6 operation to the environment

From the SRK EIA report (SRK, 2012) the following operational impacts were identified as HIGH and MEDIUM – HIGH residual operational risks:

HIGH Risk - Positive impact on the reduction in Mean Annual Runoff (MAR)

MEDIUM – HIGH - Impact on habitat fragmentation

The report further looked at the impacts that require careful mitigation but concluded that all these impacts could be effectively managed. These impacts are as follows:

- Impacts on fauna and flora;
- Impacts on surface and groundwater quality as a result from the FAD 6 activities;
- Air Quality impacts resulting from PM10 and Dust Fall Out emissions;
- Impacts on Wetland destruction and quality;
- Traffic safety as a result of the re – alignment D714 and increased traffic;
- Noise levels during the construction and operation phase of the project; and
- Impact on the wetland areas.

The EMP that was developed as part of the 2012 EIA by SRK, makes provision to ensure these impacts are managed throughout the process.

2.3 South African environmental governance structures applicable to FAD6

Environmental governance structures in South Africa consists of the Department of Environment, Forestry and Fisheries (DEFF) and Department of Water Affairs (DWS), both forming part of the Economic Services and Infrastructure Development cluster within National Government (National Government of South Africa, n.d.).

2.3.1 Department of Environment, Forestry and Fisheries (DEFF)

The Department of Environment, Forestry and Fisheries (DEFF) is mandated, as required in section 24 of The Constitution of South Africa (South Africa, 1996), to ensure the protection of the environment for the future and to provide an environment that is not harmful to the health or well-being of the citizens of South Africa. DEFF therefore provides “leadership in environmental management, conservation and protection towards sustainability for the benefit of South Africans and the global community” (DEFF, n.d.).

The Department has as its objectives to provide leadership, strategic, centralised administration, executive support, corporate services, and to facilitate effective cooperative governance, international relations, and environmental education and awareness. DEFF further promotes the development and implementation of an enabling legal regime and licensing/authorisation system to ensure enforcement and compliance with environmental law. The department promote, manage and provide strategic leadership on oceans and coastal conservation and drive improvement of air and atmospheric quality. They provide leadership and support, inform, monitor and report efficient and effective international, national and significant provincial and local responses to climate change, ensure the regulation and management of all biodiversity, heritage and conservation matters in a manner that facilitates sustainable economic growth and development. DEFF implemented expanded public works and green economy projects in the environmental sector and they manage and ensure that chemicals and waste management policies and legislation are implemented and enforced in compliance with chemicals and waste management authorisations, directives and agreements.

DEFF consists of various branches (DEFF, 2019), that includes:

- Regulatory, Compliance and Sector Monitoring.
- Oceans and Coasts.
- Chemicals and Waste Management.
- Corporate Management Services.
- Biodiversity and Conservation.
- Environmental Programmes.
- Climate Change, Air Quality and Sustainable Development.

Figure 2.2 below shows a breakdown of the various branches and their relevance to the FAD 6 facility.

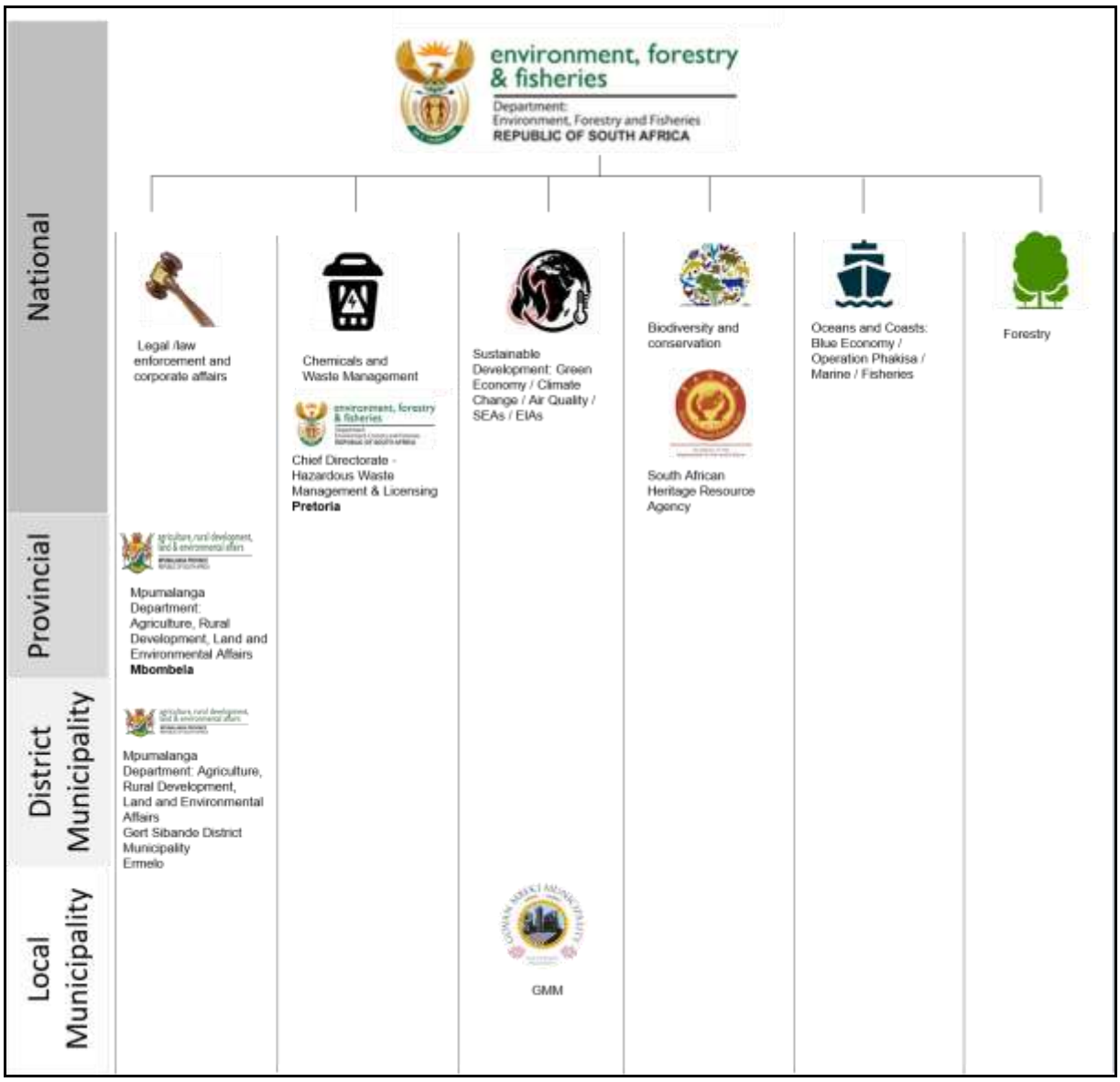


Figure 2.2: Department of Environment, Forestry and Fisheries structure.

Regulatory, Compliance and Sector Monitoring Branch has as its primary purpose to promote the development of a system that will enable the legal enforcement with compliance requirements for licensing and authorisation. The functions of the branch include providing a quality, efficient and effective legal service that makes it possible for DEA to protect and conserve the environment and to deliver the Departmental mandate, management of the regulatory framework for environmental impacts, promotion and enforcement of environmental legislative compliance and to provide cooperative governance and support to the Chemicals and Waste Management office. The environmental authorisation for the FAD 6 facility and the approval of the EMP was issued by the Department of Agriculture, Rural Development, Land and Environmental Affairs in Mpumalanga (MDARDLEA).

The purpose of the Chemicals and Waste Management Branch is to manage the implementation of chemicals and waste management policies and legislation and to enforced compliance with chemicals and waste management authorizations, directives and agreements. This branch of the DEFF develops and implements efficient and effective processes and systems for authorising waste management activities and contaminated land remediation to minimise the impacts of hazardous waste streams on the environment. They develop national policies, strategies, legislation and norms and standards, build capacity in government, industry and civil society to ensure good waste management and to monitor and evaluate the impact of policy on chemicals and waste management. The Chemicals and Waste Management branch applies cooperative governance in multi-lateral chemicals and waste agreements to manage, facilitate, plan and coordinate with other government departments. The FAD 6 facility received their WML from the DEA Chemicals and waste Management branch in Pretoria.

Biodiversity and Conservation has as its purpose the “establishment, management and maintenance of ecologically representative national and cross-border systems of protected areas to advance the heritage of humankind as well as contribute to the three objectives of the CBD and Millennium Development Goals”. It functions through a regional network to ensure ecologically balanced conservation areas, safeguard of World Heritage Sites and key ecological processes that provides protection against climate change, establishment of effective governance and monitoring systems for protected areas with international obligations and the management of strategic, administration, logistical and financial support to the Chief Directorate. No permits were issued from the South African National Biodiversity Institute (SANBI). The South African Heritage Resource Agency (SAHRA) issued a permit for FAD 6, but this was only valid from 16/07/2015 to 10/07/2018 and was therefore not reviewed as part of the data set for this study. The permit is issued on a national level.

The purpose of Climate Change, Air Quality and Sustainable Development is “to improve air and atmospheric quality, lead and support, inform, monitor and report efficient and effective international, national and significant provincial and local responses to climate change”. In terms of air pollution, they function to ensure that reasonable legislative and other measures are developed, implemented and maintained in such a way as to protect and defend the right of all to air and atmospheric quality that is not harmful to health and well-being. The AEL for the Sasol Secunda Operations does not include conditions for FAD 6 specifically and the requirements for controlling and monitoring dust are included in the authorisations, management plans and licenses for the facility. AELs are however issued and managed on

municipal level, so if an AEL was required for the facility, it would have been issued by the Govan Mbeki Local Municipality in Secunda.

Environmental Programmes (EPs) are responsible for identifying and ensuring implementation of programmes that employ Expanded Public Works Programmes (EPWP) principles. The EPWP aims to address unemployment, by working with communities to identify beneficial local opportunities thereby achieving poverty alleviation and household upliftment by creating jobs and developing skills that bring about balance between social, economic and environment for sustainable living. The EP is not involved with the FAD 6 facility.

The purpose of Corporate Management Services is to co-ordinate and manage the strategic functions and operations of the department.

Oceans and Coasts have a very important role to play in the environment. The national marine and coastal assets which provide and sustain a wide range of economic, social and ecological services. They do not have any inputs into the FAD 6 facility.

The purpose of Forestry Management is to provide strategic direction and leadership to the department about the management, use and protection of forests and natural resources.

It can therefore be concluded that the DEFF's involvement in the FAD 6 facility extends to Regulatory, Compliance and Sector Monitoring and Chemicals and Waste Management. While Biodiversity and Conservation was relevant pre-construction, they are no longer involved and the only consideration towards air quality as part of the Climate Change, Air Quality and Sustainable Development branch is dust management and monitoring which is not included in the AEL, but is covered under the authorisations, management plans and the licenses for the facility.

2.3.2 Department of Water Affairs (DWS)

The Department of Water and Sanitation (DWS) is mandated to devise and implement steps towards the integrated management of water resources in South Africa. The mission of the DWS, as published on their website (DWS, n.d.), is to serve the people of South Africa by: making a positive impact on the country and its people as custodians of its water and sanitation resources, and as innovative and committed partners in the drive for sustainable development; being service- and delivery-orientated; leading its sector and enabling partners with the knowledge and capacity to ensure that all water services are delivered; being

committed to innovation and using cutting-edge technology as a catalyst for positive change, connecting its people and enabling them to work anywhere, anytime; and having a heart that values its investment in its people. The Department's strategic goals are:

- To be an efficient, effective and development-orientated sector leader;
- Equitable and sustainable provision of raw water;
- Provision of equitable and sustainable water services of acceptable quantity and quality; and
- Protection of freshwater ecosystems.

The Integrated Water Resource Management is actioned on National Level, falls under the cluster of Economic and Infrastructure Development and within the Department of Water and Sanitation (DWS).

The DWS is divided into thirteen public reporting entities (National Government of South Africa, n.d.):

- Amatola Water
- Bloem Water
- Breede-Gouritz Catchment Management Agency
- Inkomati-Usuthu Catchment Management Agency (IUCMA)
- Lepelle Northern Water
- Magalies Water
- Mhlathuze Water
- Overberg Water Board
- Rand Water
- Sedibeng Water
- Trans-Caledon Tunnel Authority (TCTA)
- Umgeni Water
- Water Research Commission (WRC)

The Rand Water management agency is the largest bulk water utility in Africa. This public entity provides potable water to more than 11 million people in Gauteng, parts of Mpumalanga, the Free State and North West (National Government of South Africa, n.d). Rand Water provides purification and supply of water to various municipalities, mines and industries (Figure 2.3). Sasol Secunda Industrial Complex (SSIC) falls within the Rand Water entity and therefore their governance.

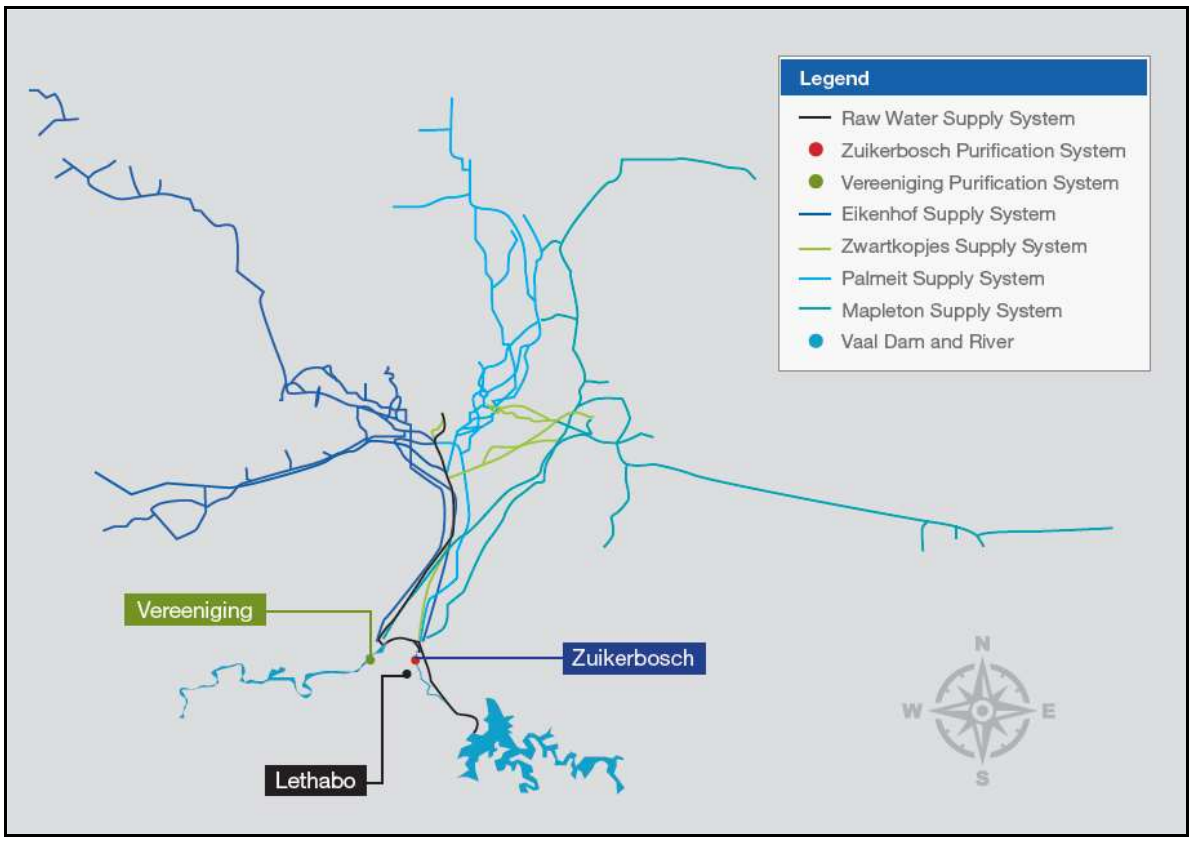


Figure 2.3: Rand Water's Water Purification and Water Supply System (Rand Water, 2019:105).

The Rand Water primarily draws raw water from the Vaal River System. It comprises of two river stations (Zuikerbosch and Vereeniging) where water is purified and pumped to various users (Rand Water, 2019:82). Approximately 90% of this water is then pumped, by four booster stations on the southern side of the Witwatersrand ridge. These booster stations, together with Zuikerbosch station, pump bulk water to various regions as detailed in Table 2.2 below.

Table 2.2: Rand Water pump stations and regions (Rand Water, 2019:82).

Pump stations	Regions supplied
Zuikerbosch/Vereeniging	• Southern Gauteng • Northern Free State (localised) • All booster pumping stations
Eikenhof	• Western and north-western Johannesburg • West Rand • Greater Rustenburg
Zwartkopies	• Central Johannesburg • High lying portion of the East Rand
Palmiet	• Eastern and northern Johannesburg • Large parts of Tshwane

Pump stations	Regions supplied
	• Western portions of Ekurhuleni
Mapleton	• Central and eastern parts of Tshwane and Ekurhuleni • Selected areas in Mpumalanga

On 30 March 2012, the Department of Water and Environmental Affairs[3] approved the establishment of nine Catchment Management Agencies (CMAs) in South Africa in order to help manage water resources and to facilitate stakeholder input into the management of water resources. These CMAs are depicted in Figure 2.4 below.

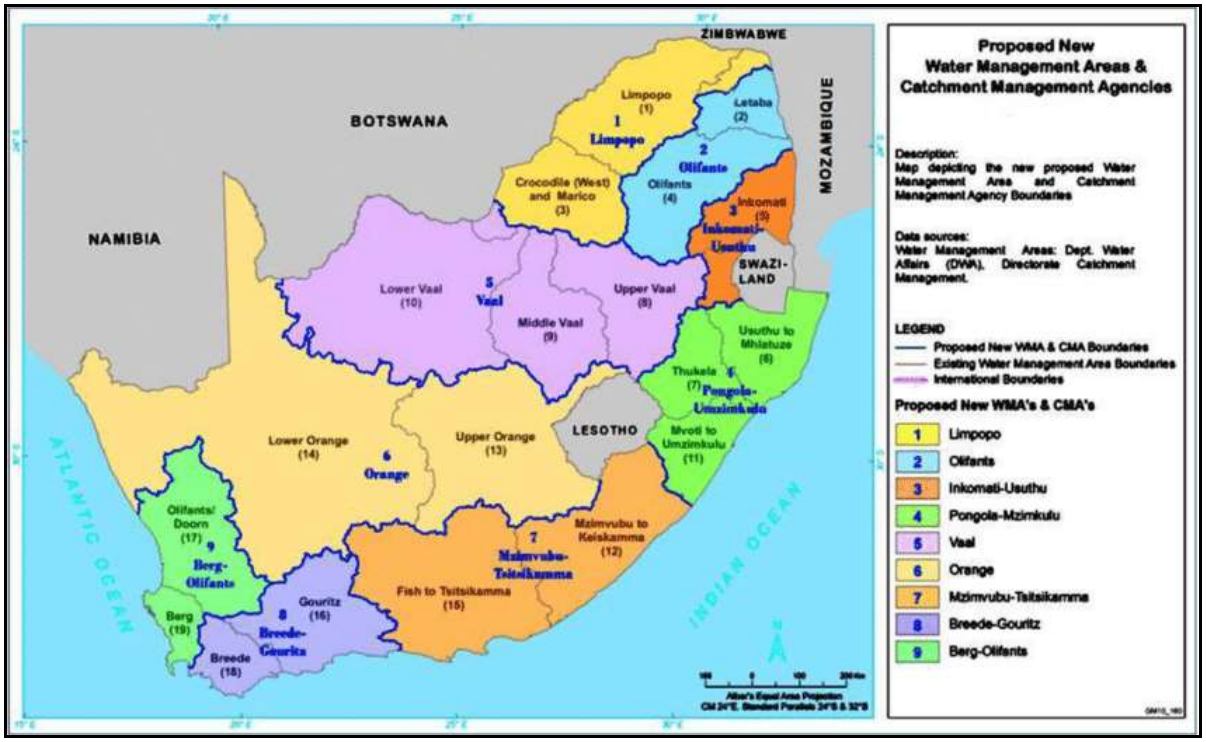


Figure 2.4: Proposed New Water Management Area and Catchment Management Agencies (South African Government, 2012).

Water flows across local and provincial boundaries and therefore is not managed or governed in line with administrative governance structures. Water resource management and governance therefore aligns with various catchments that are referred to as Catchment Management Agencies or Proto-Catchment Management Agencies. South Africa has two CMAs namely the Breede-Gouritz and Inkomati-Usutu and seven proto-CMAs namely Limpopo, Olifants (Mpumalanga Province), Pongola-Umzimkulu, Vaal, Orange, Mzimvubu-Tsitsikamma, and Berg-Olifants (Western Cape). A proto-CMA is an agency in the process of being established and are managed by the respective regional offices of the DWS (Meissner et al, 2016:19).

[3] The Department of Water and Sanitation (DWS) was formerly known as the Department of Water Affairs (DWA)

The water use license for FAD 6 is issued by the National Department of Water and Sanitation while the General Authorisations are issued by the Vaal Proto CMA (VPCMA) that was gazetted for establishment in January 2016 (DWS, 2016). The VPCMA is a public entity that was established to service the Central North Eastern area of South Africa and extends from Kuruman in the Northern Cape Ermelo in Mpumalanga. The northwest border is the Crocodile river close to Botswana and to the south east, it borders with Lesotho.

CMAs play an important role in public consultation, involving affected communities and in addressing stakeholder concerns. The VPCMA was established in terms of the National Water Act and has as its primary duty to investigate and advise interested persons on the protection, use, development, conservation, management and control of the water resources in its water management area. CMAs work to a specific management strategy which enables the co-ordination of related activities of water users and of the water management institutions within its water management area to ensure the protection and responsible use, development, conservation, management and control of the water resources in its water management area (Redelinghuis, 2016). No official organogram could be found but the governance of water for SSIC is depicted in Figure 2.5 below.

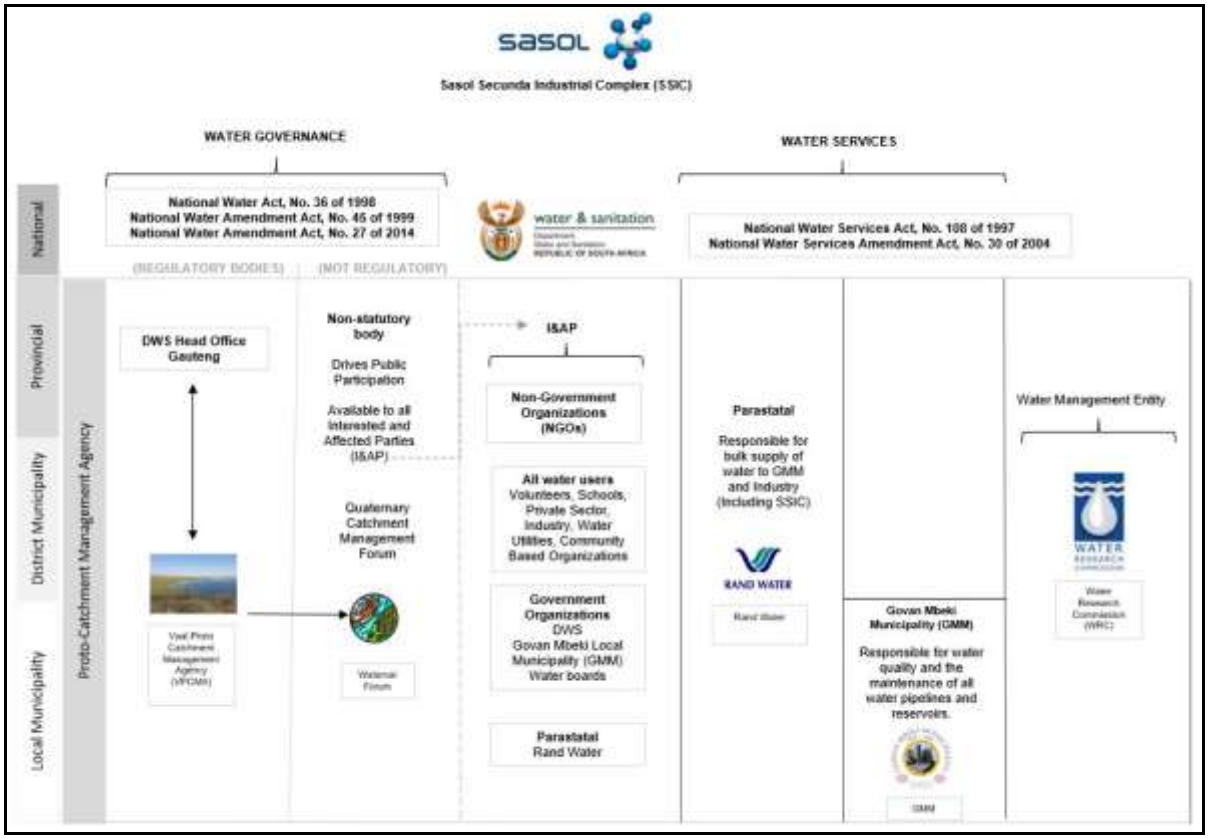


Figure 2.5: DWS Structure applicable to SSIC.

Pillay (2016) explored the perspectives of governance in sustainable policy development in order to gain an understanding of the institutional frameworks for water resource management and concluded that although the South African constitution and policy frameworks are geared toward sustainable water resource management, implementation remains one of the main institutional constraints (Pillay, 2016). Pillay (2016) further pointed out that many of these implementational challenge exist around the institutional structures and operations and that the real issue is centred around the thinking that abiding to the law will solve the issue of sustainable resource management. Compliance with legislation or policies is not the problem. The study further concluded that Integrated Water Resource Management (IWRM) is progressing slowly due to a lack of skills development and slow implementation and that policy makers need to "consider the adaptive water management approach" to sort out the internal institutional structure issues and in order to better align and coordinate between the various stakeholders. Pillay (2016) wanted to understand the management of water resources and its constraint by looking at the institutional framework for achieving sustainable water resource management (Table 2.3).

Table 2.3: Pursuing institutional frameworks (Pillay, 2016).

	National	Local	Rand Water	Common Theme
Pursuing Institutional Frameworks to Achieve Sustainable WRM	• National climate change white paper • Near-term priority flagship programmes • Statutory instruments • Cooperative governance (inland water ecosystem committee) • Focus on committees, working groups and councils • Coordination between government spheres • Linking to international bodies • NWRS2, IWRM, Reconciliation Strategies	• CMA's • Line of reporting of water boards to local government • By-law enforcement Use of SALGA to liaise with the water board • Old Mvula Trust • Model • Water affairs • Water boards • Municipal service authorities	• NWRS2, NWA, NEMA	• NWRS2

Mofokeng (2017), in a study titled "Challenges in developing water management institutions: The case of catchment management agencies (CMAs) in South Africa", points out that there is a lack of urgency in the implementation of water management strategies and policy frameworks (Mofokeng, 2017). Ntola and Le Roy commented that South Africa would benefit from an independent water regulator, as water sector in the country is "inadequtely regulated" (Ntola, and Le Roy, 2019).

The DWS has a complex management system with many stakeholders. The Vaal Proto CMA is however responsible for the licensing of the facility and they are supported by the DWS head office in terms of engineering, (c) and (i) water uses and geohydrology.

2.4 Environmental legislation in South Africa (applicable to FAD6)

The South African Constitution is clear about the requirements for co-operative governance and sets out the required principles for this objective in Chapter 3 - in fulfilment of the obligations set in Section 24 of the Constitution (South Africa, 1996). In order to establish a framework for national, provincial and local governments to promote and facilitate intergovernmental relations and to provide for mechanisms and procedures to facilitate the settlement of intergovernmental disputes, the Intergovernmental Relations Framework Act, 2005 (Act No. 13 of 2005) was assented to on 15 August 2005 (Republic of South Africa, 2005).

South African laws are made in Parliament by the national legislature or law-making body (Parliament of RSA, n.d.). Once a Bill is passed by both Houses of Parliament, the National Assembly (NA) and the National Council of Provinces (NCOP), it becomes an Act of Parliament and law. The Acts applicable to the governance of the environment in South Africa, and specifically to the FAD 6 facility at the SSIC are as follows:

- The Constitution of South Africa, 1996.
- Intergovernmental Relations Framework Act, No. 13 of 2005.
- National Water Act, No. 36 of 1998.
- National Water Amendment Act, No. 45 of 1999.
- National Water Amendment Act, No. 27 of 2014.
- National Water Services Act, No. 108 of 1997.
- National Water Services Amendment Act, No. 30 of 2004.
- National Environmental Management Act, No. 107 of 1998.
- National Environmental Management Amendment Act, No. 56 of 2002.
- National Environmental Management Amendment Act, No. 46 of 2003.
- National Environmental Management Amendment Act, No. 8 of 2004.
- National Environmental Management Amendment Act, No. 62 of 2008.
- National Environmental Management: Waste Management Act, No. 59 of 2008.
- National Environmental Management: Waste Management Amendment Act, No. 46 of 2014.
- National Environmental Management Biodiversity Act, No. 10 of 2004.

- National Environmental Management: Air Quality Act, No. 39 of 2004.
- National Environmental Management: Air Quality Amendment Act, No. 20 of 2014.

These Acts of law, together with the relevant supporting regulations, will be discussed in the following sections. Feris (2010), when evaluating the role of good environmental governance in sustainable development of South Africa, concluded that environmental protection is the key consideration in the NEMA. While there are social and economic considerations the primary objective of the law is to protect the environment. South African environmental law is therefore considered as a good framework, but the author noted that decision-makers' interpretation of environmental law is more often motivated by social and economic consideration.

For the purpose of this study, the evaluation of environmental legislation will therefore not be focused on the ability of environmental laws, policies and framework to protect the environment, but rather on the effectiveness of the law as it is interpreted and applied. The evaluation of the applicable legislation will therefore focus on how governing bodies communicate and interact at the various levels, to ensure the effective protection of the environment and on the allowances made in legislation to ensure efficient governance.

In order to ensure efficient governance all allowances made in legislation should be considered. Efficiency is required to ensure effective prevention of over regulation. The following legislation will be reviewed to evaluate efficiency:

- GN 509 of 26 August 2016: General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in section 21(c) or section 21(i).
- GNR 1159 of 10 December 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Amendments to Environmental Impact Assessment Regulations, 2010 and Listing Notices.
- GNR 544 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 1: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D.
- GNR 545 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 2: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D.
- GN 921 of 29 November 2013: National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008), List of waste management activities that have, or are likely to have, a detrimental effect on the environment.

2.4.1 National Water Act

The National Water Act (Act 36 of 1998) was assented on 20 August 1998. The purpose of the Act is to ensure that water resources are protected, used, developed, conserved, managed, and controlled to ensure equitable, safe and reliable water resources. The Department of Water and Sanitation (DWS) is considered the public trustee of the nation's water resources. Chapter 2, part 1, of the Act charges the Minister of Water and Sanitation with the development and implementation of the national water resource strategy which is binding to all authorities and institutions and part 2 deals with the establishment of catchment management strategies. Section 10 of the Act specifies consultation with any organ of state which has an interest in the content, effect or implementation of the catchment management strategy. Chapter 3 deals with the overall protection of water resources and sections, 12-17 deals specifically with water classification and the human needs and ecological reserve. These sections make provision for public participation. Sections 19-20 deals with pollution prevention, mitigation and the impact of emergency incidents on water quality, including governance role by CMAs. Water use and the overall responsibility of National Government to manage and distribute water equitably is dealt with in Chapter 4 of the NWA. This chapter further deals with the requirement to obtain licenses and permits for the various required uses. Section 22(3) makes allowance for dispensation of such licensing if the purpose of the NWA can be met by a licence or permit granted by another authority under a different law and section 22(4) encourages co-operative governance through the promotion of combined license with other organs of state. This chapter also deals with the transfer of water use authorisations, regulations on the use of water as well as the considerations given to, and the conditions and requirements of general authorisations and licenses. Part 6 of this chapter deals with issuing of general authorisations and licenses for specific water sources respectively and both these processes requires public participation prior to issue.

Chapter 7 of the Act gives the Minister the mandate to establish Water Management Institutions (WMIs). The purpose of these WMIs, in the form of Catchment Management Agencies (CMAs), is to manage, monitor, conserve and protect water resources and implement catchment management strategies. While CMAs have as their primary function water management, chapter 8 deals with the establishment, powers and disestablishment of water user associations. These are water management institutions, but they do not manage water. They operate at local level, constitute individual water users and serve as co-operative associations to ensure mutual benefit to all water users. Chapter 12 deals with dam safety and the requirements and regulation of such structures. FAD6 does require regulation in

terms of dam safety. Schedule 3 of the act deals with duties of CMAs and the continued requirements for public participation but does not include any discussions around co-operative governance. Two amendments of the NWA have been published. National Water Amendment Act (Act 45 of 1999) and National Water Amendment Act (Act 27 of 2014).

The National Water Amendment Act (Act 45 of 1999) was published for purpose of textual improvements and also to change the procedure for the appointment of members of the Water Tribunal. No details included that affects co-operative governance.

The National Water Amendment Act (Act 27 of 2014) was assented to in 30 May 2014. Relevant amendments include the addition of Section 26(5) which makes provision for co-operative governance as per the agreement of section 163A whereby the Minister is required to get concurrence with the Ministers of mineral resources and also environmental affairs prior to making amendments that may influence them. Addition of subsection 41 3.(b) requires alignment with process for consideration of a water use license with the timeframes and processes specified in the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) as it relates to the application for licenses and permits and in the National Environmental Management Act, 1998 (Act No. 107 of 1998) as it relates to the application for environmental authorisations. Section 163A was inserted as indicated, but further to the Section 26(5) impact, this also allows for agreement to be reached between the various Ministers responsible for water, mineral resources and for environmental affairs titled One Environmental System for the country, but this is only applicable with respect to mining.

2.4.2 National Water Services Act

The Water Services Act, Act No. 108 of 1997, (WSA) defines the service requirements of the water management entities. The Act was amended in 2004 - National Water Services Amendment Act, No. 30 of 2004. The Vaal River Catchment Management Agency (VRCMA) was gazetted for establishment in January 2016 (DWS, 2016), and forms part of the Rand Water management agency. The primary focus of the WSA is however the responsibilities of the water services authorities at local level. Local water services authorities are responsible for the provision of safe drinking water and to ensure sustainable water use.

2.4.3 National Environmental Management Act

The National Environmental Management Act, No. 107 of 1998 (NEMA) was assented to on 19 November 1998. NEMA intends to provide governance through directives for the

establishment of principles for decisions relating to environmental, procedures for functional co-ordination and all other related matters. The Act defines environment as the surroundings within which humans exist and includes land. water and atmosphere as part of the definition. Section 2. (4)(b) specifically point to the fact that all environmental elements are “linked” and “integrated” and that this needs to be considered when decisions are made around environmental management. Section 2. (4)(l) highlights the requirement for “intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment” and that conflicts of interest should be resolved through various procedures. NEMA requires the establishment of a committee for environmental co-ordination to promote integration of the governance of environmental aspects, with section 7. (3) describing the functions of such an integrated committee. These functions include, among others, the co-ordination of applications for authorisations and licenses that require inputs from various organs of state and specifically, in section 7. (3)(d) specifies co-operation to prevent duplication of efforts to protect the environment. The Mpumalanga Environmental Implementation Plan (EIP) was created in fulfilment of the requirements set out by Section 11 of the National Environmental Management Act (Act 107 of 1998, as Amended) and lays out the functions, policies, plans and programs to ensure co-operative governance (MDARDLEA, 2016). Section 4 of the EIP describes how organ of state exercise provincial co-operative functions. MDARDLEA meets with DWS on a continual basis to assist with appraisal of water use license applications and to guide the coordination of enforcement processes. Chapter 5 of NEMA deals with the integration of environmental management and has as its objective to encourage the use of appropriate management tools to ensure effective integration. Section 24 further promotes the consideration of all environmental, socio-economic and cultural heritage impacts when authorisation is requested and that this must be done in consultation of any other Minister if this requirement fall within their jurisdiction. Section 24. (5) further states that compliance with required regulations does not remove the requirement to “obtain authorisation for that activity from any other organ of state charged by law with authorizing. permitting or otherwise allowing the implementation of the activity”. Schedules 1 and 2, lists the DWS as one of the “National departments exercising functions which may affect the environment” (Section 11(1)) and “National departments exercising functions that involve the management of the environment” (Section 11(2)). NEMA has been revised four times and the amendments as follows:

- National Environmental Management Amendment Act, No. 56 of 2002, with specific reference to co-operative governance.
- National Environmental Management Amendment Act, No. 46 of 2003, with the inclusion of section 47B. that regarding the consultation requirements with organs of state.

- National Environmental Management Amendment Act, No. 8 of 2004, Section 24 was substituted to address environmental authorisations with its objective to drive integrated environmental management and that the potential impacts of listed activities on the environment be considered, investigated, assessed and reported on to the competent authority charged by NEMA. Sections 24A to 24I was inserted to address the procedures for listing and delisting activities, for identifying the competent authority responsible for granting authorisations related to those activities and to address the requirements set out in the authorisations.
- National Environmental Management Amendment Act, No. 62 of 2008, included various changes to definitions and Sections 24A to 24I and inserted Sections 24J to 24R that relates to co-operative governance and consultation between organs of state, alignment of environmental authorisations, exemptions, requirements for the submission on environmental management programmes when environmental impact assessment were required as part of application for authorisation, requirements when considering application, financial provisions, monitoring and performance assessments and closure consideration.

It can be concluded that NEMA makes provision for co-operative governance and that there should be consultation between the various organs of state to ensure inclusive decision making related to the authorisation of any activities that may impact the environment. The Act however does not detail the specifics of how this should happen.

2.4.4 Environmental Impact Assessment Regulations

The Environmental Impact Assessment (EIA) Regulations, GNR 982 of 2014 (as amended), is a tool that drives the integration of, and specifies the process of review and evaluation of activities that may have a potential social, economic or environmental impact on the environment and intends to prevent negative impacts where they cannot be avoided, to ensure sufficient mitigation and management of negative environmental impacts, while optimising positive environmental impacts (Department of Environmental Affairs, 2018). NEMA requires that an environmental authorisation is obtained from a competent authority before commencing any listed activity in terms of the EIA Listing Notices for Basic Assessment, Scoping and Environmental Impact Assessment. The EIA Regulations were initially promulgated in in terms of the Environment Conservation Act (ECA), Act No 73 of 1989 and then again in 2006 in terms of NEMA, Act No 107 of 1998. Table 2.4, Table 2.5 and Table 2.6 below depicts the various amendments to the EIA regulations from 1998 to 2020.

Table 2.4: Previous sets of EIA Regulations and Listing Notices (Department of Environmental Affairs, 2018).

EIA Regulations	Government Gazette	Effective Dates
EIA Regulations promulgated in terms of the Environment Conservation Act (ECA), Act No 73 of 1989	GNR 1182 and 1183: Government Gazette 18261, Pretoria, 05 September 1997	08 September 1997 – end of day 09 May 2002.
Amendment of the ECA EIA Regulations	GNR 670 and GNR 672: Government Gazette 23401, Pretoria, 10 May 2002	10 May 2002 – end of day 02 July 2006.
2006 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 385, 386 and 387: Government Gazette 28753, Pretoria, 21 April 2006	03 July 2006 – end of day 01 August 2010
2010 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 543, 544, 545 and 546: Government Gazette 33306, Pretoria, 18 June 2010	02 August 2010 – end of day 07 December 2014

Table 2.5: Current EIA Regulations (including the 2017 Amendments) (Department of Environmental Affairs, 2018).

EIA Regulations	Government Gazette	Effective Dates
2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 982, 983, 984 and 985: Government Gazette 38282, Pretoria, 04 December 2014	08 December 2014 – end of day 06 April 2017
Amended 2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 324, 325, 326 and 327: Government Gazette 40772, Pretoria, 07 April 2017	07 April 2017 – current

Table 2.6: 2014 EIA Regulations as amended.

EIA Regulations	Government Gazette	Effective Dates
Amended 2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 706: Government Gazette 41766, Pretoria, 13 July 2018	13 July 2018 – current
Amended 2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 599: Government Gazette 43358, Pretoria, 29 May 2020	29 May 2020 – current

The intent of the EIA regulations is to evaluate the potential impacts of any proposed development on the environment in line with the requirements set out in Chapter 5 of the NEMA (Department of Environmental Affairs, 1998). Once environmental authorisation is

issued by the competent authority, the public participation process commences through notification to all interested and affected parties.

Part 1, Section 7, of the regulations deals with “Consultation between competent authority and organs of state administering a law relating to a matter affecting the environment”. Section 7. (3) requires cooperative governance between competent authorities and any authority empowered by specific environmental management Acts or other legislation where there is a requirement for authorisation, licensing or permits. Section 11 of the EIA regulations allow for interrelated activities at the same or different locations within the same jurisdiction of the competent authority to be considered through a single application. Section 16. (2) of the regulation states that an applicant may only apply for authorisation after acceptance of an application for any right or permit has been made in line with the terms of the Mineral and Petroleum Resources Development Act, 2002. The regulation specifies, in section 24 (e), the audit frequency for environmental authorisation, management programme and closure plans and that compliance audits may not exceed intervals of five years. Register of interested and affected parties must include all organs of state which have jurisdiction in respect of the application (Section 42 (c) of EIA regulations). Cooperative governance is required through section 43 (2) of the regulation that requires that any State department that administers a law relating to a matter affecting the environment must be requested to give comment related to any application. The 2014 EIA regulations and listing notices were amended on three occasions. The amendments as follows:

- GNR 326 of 07 April 2017 is the amendment of the Environmental Impact Assessment (EIA) Regulations, GNR 982 of 2014, that was promulgated in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) and addresses changes to some general items such as definitions and timeframes, and for the purpose of this study, changes related to cooperative governance. Chapter 3, Section 7, reinforces the requirement to consult with every organ of state that administers law related to matters affecting the environment and that such requests must be commented on within a 30-day period.
- GNR 706 of 13 July 2018: is the amendment of the Environmental Impact Assessment (EIA) Regulations, GNR 982 of 2014, that was promulgated in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) and is a correction around the definition for “previous NEMA notice” as well as an amendment to Listing Notices 1 and 3.
- GNR 599 of 29 May 2020 is the amendment of the Environmental Impact Assessment (EIA) Regulations, GNR 982 of 2014, that was promulgated in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998) and is an extension of the

timelines proposed for submission of audit report for environmental authorisation and management plans that were in effect on 4 December 2014.

The 2018 EIA booklet published by the Department of Environmental Affairs references and effectiveness and efficiency review of EIA study and concluded that “EIA in South Africa is marginally effective and it should not be discarded as an instrument as there is currently nothing better to take its place”, but that it was not effective for all types of development. Limitations highlighted were the interpretation of the regulations and inconsistency with the responses provided by various authorities. The EIA regulations do make provision for cooperative governance, but the strict requirements are time consuming and costly and has therefore been cited as a development barrier in some instances and that it is considered “fit for purpose” but lacks the ability to achieve sustainable development (Department of Environmental Affairs, 2018).

2.4.5 National Environmental Management: Waste Management Act

The National Environmental Management: Waste Management Act, No. 59 of 2008, was assented to on 06 March 2009 in order to regulate waste management for the protection of health and the environment. The Act provides measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development and provides guidelines for institutional arrangements, planning matters, national norms and standards, specific waste management activities, remediation of contaminated land, a national waste information system, compliance and enforcement.

Chapter 2, Section 6. (1)(c), specifically states the requirement for measures to achieve co-operative governance in waste management matters as part of the national waste management strategy. Section 6 further indicates the general requirements for binding various organs of state and the delineation of responsibilities related to the national waste management strategy. Section 36 of the Act specifies the requirement for consultation with the DWS and other organs of state concerned with the identification and notification of investigation areas pertaining to contaminated land. Chapter 5 deals with licensing of waste management activities with Section 44 dealing specifically with co-operative governance, stating that the licensing authority must as “far as practicable in the circumstances co-ordinate or consolidate the application and decision-making processes contemplated with the decision-making process in Chapter 5 of the National Environmental Management Act and other legislation administered by other organs of state, without whose authorisation or approval or consent the activity may not commence, or be undertaken or conducted”. There must be coordination between organs of state to ensure that all applicable legislation is

considered, that there is consistency in the application of the legislation and that licenses may be consolidated if required and that integrated licenses must be “regarded as an integrated environmental authorisation”. Section 47 requires the licensing authority to invite written comments from any organ of state that may have an interest in the waste management activity. Chapter 7, Section 65, states that the Minister of DWS may exercise any powers conferred on him or her by section 19, 53 and 155 or the National Water Act, 1998 (Act No. 36 of 1998) in the event of contravention of the conditions of a waste management licence that may lead to an impact on a water resource. Co-operative governance is further highlighted in Section 72 of the Act where consultation is required from all cabinet members that may be involvement with the exercise of power related to waste management. In the instance where an application for exemption is received, the DEFF must bring that application to the attention of potential / relevant organs of state to ensure co-operative governance.

The National Environmental Management: Waste Management Amendment Act, No. 46 of 2014, was published for general information on 02 June 2014. The various amendments to the Act include omissions and additions related to definitions, to exclude the department from the spheres of government that are required to compile integrated waste management plans, the establishment of the Waste Management Bureau and associate policy and oversight requirements and to provide for transitional provisions in respect of existing industry waste management plans and connected matters, but none of the revisions make any specific reference to changes related to co-operative governance.

2.4.6 National Environmental Management Biodiversity Act

National Environmental Management Biodiversity Act of 2004 (Act No. 10 of 2004) was assented to on 07 June 2004. The state is deemed the trustee of biological diversity and has as its may objectives to provide for the management and conservation of biological diversity, the sustainable use of indigenous biological resources and the fair and equitable sharing of this resource. The Act binds the various national, provincial and local organs of state to provide for co-operative governance in biodiversity management and conservation and the establishment of a South African National Biodiversity Institute to assist with the various components of biological diversity and conservation. The Act must be read in conjunction with the applicable provision and management principles set out in the NEMA. The Act outlines the requirements, procedures and functions of the National Biodiversity Institute for the planning, monitoring and management of the state of biodiversity in South Africa. Section 47 of the Act states the requirements for provincial consultation prior to adopting any

bioregional plans or amendments. Section 92 allows for the issue of an integrated permit if an empowered authority under a different law authorise that activity, which becomes very important during the environmental impact and basic assessment processes and the issue of authorisations, while section 99 of the Act focusses on consultation and the application of co-operative governance in line with Chapter 3 of the Constitution.

The National Environmental Management Biodiversity Act makes provision for consultation, integration and co-operative governance through the office of the DEFF.

2.4.7 National Environmental Management: Air Quality Act

The National Environmental Management: Air Quality Act, No. 39 of 2004 (NEMAQA) was assented to on 19 February 2004 and was amended through the publication of the National Environmental Management: Air Quality Amendment Act, No. 20 of 2014. NEMAQA speaks to the reform of laws regulating air quality in order to protect the environment. It requires the provision of measures that will prevent pollution and ecological degradation. It further requires the establishment of national norms and standards for regulation of air quality monitoring, management and control and for specific air quality measures. The NEMAQA, throughout, makes provision for consultative process in accordance with its sections 56 and 57 which requires consultation with both the Cabinet and Executive Council when exercising power and in accordance with the principles of co-operative governance as required in Chapter 3 of the Constitution, consultation with the MEC responsible for air quality in each province that is affected by that exercise of power as well as the requirement for public participation. FAD6 is not however a listed activity and therefore the only applicable aspect related to air quality impact is the control of dust.

The literature review of the existing legislative bodies / structures and their governance roles and workings revealed a definite intent for co-operative governance and inclusion of all relevant stakeholders within the organs of state to work towards an efficient and effective management of natural resources as they relate to sustainable use for economic development. The option for dispensation is however only catered for in the water act.

2.5 Other studies

Not many other studies have been done in relation to the evaluation of the effectiveness of environmental legislation for the SSIC. In the early stages of developing strategic

environmental assessment (SEA) Verheem and Tonk (2000) evaluated the different approaches taken for drafting legislation and for implementing management programs. They concluded that there should be flexibility in the approach and implementation depending on the country, industry and process being considered. Mtolo4 researched the perceptions and expectations of stakeholders involved in the development process of Environmental Management Frameworks in order to gain information that can be utilised in making South African EMFs more efficient and effective (Mtolo, 2010). The main conclusions from this study indicated that the EMF must be legally enforceable, requires cooperative governance in line with a set of principles, must clearly define roles and responsibilities at all governance levels, involves good stakeholder engagement, is dependent on good quality information to ensure environmental performance and requires an adequate budget. The study resulted in various recommendations around the legal enforcement of EMFs, improved stakeholder relationships, partnerships between public and private bodies as well as realistic budget allocations to drive the protection of the environment. Research into the application of EMF in other industries draws similar conclusion. An evaluation of the procedural framework for environmental management in deep-sea mining projects (Durdena et. al., 2020), described the EMP as a “conceptual model” designed not only to facilitate and guide environmental management but also as an enhancement of the regulations specific to deep sea mining when integrated. The study does however emphasise that this makes for a precautionary approach at various project levels.

[4] The Environmental Management Framework Regulation (GNR547 of 2010) was issue in the same year as this dissertation, but Mtolo adhered to the NEMA EIA Regulations of 2006.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

Research design is a qualitative study of all licenses and authorisations issued to the Sasol Secunda Industrial Complex's FAD6 facility as well as an evaluation of the legislative structures that govern the requirements set out within them.

3.2 Research Methodologies

3.2.1 Desk-top study and Literature review

Comparative study between all existing licenses, authorisations, permits and management plans issued to the FAD6 facility to quantify overlap and possible over-regulation.

Comprehensive literature review predominantly consists of:

- Existing legislative bodies / structures and their governance roles and workings.
- Dispensation options and the implementation thereof, within relevant environmental legislation, to prevent over-regulation while efficiently and effectively protecting the environment.

In order to answer the research questions related to the communication and interaction between governing bodies it is necessary to understand the interactions between those specific governing bodies that issues the authorizations, licences and management plans pertaining to the FAD 6. This includes discussions around the possibility to allow for dispensation if the relevant legislation regulating the issue of the licenses, authorizations and management plans are considered.

3.2.2 Data collection

Data collection was aimed specifically to answer the research questions set out in section 1.3 of this dissertation. Data was collected from existing environmental licenses, permits, authorisations and management plans that have been issued for the FAD6 facility situated at the SSIC. Results from semi structured interviews with regulatory case officers at the various issuing authorities and with the Sasol specialist involved with the regulatory bodies and was used to determine the consideration given by regulatory bodies prior to issuing licenses and authorizations. Evaluation of specific legislation that forms the basis for the regulatory

requirements, was done to establish the extent of allowances made in legislation to ensure efficient governance.

3.2.2.1 Licences

Two licenses exist for the FAD 6 facility and are kept on site and includes the following:

- Water use license number 01/C12D/CGI/4076 was issued by the Department of Water and Sanitation (DWS) in 2016.
- Waste management license number 12/9/11/L180410154620/6 was issued by the Department of Environmental Affairs in 2019.

These licenses are available for this study with permission from SSIC.

3.2.2.2 Management plans and Risk assessment

Prior to the construction of the FAD 6 facility an environmental management plan (EMP) was developed and approved. This EMP formed the basis and motivation for the issue of environmental authorization. The EMP was approved by Department of Economic Development, Environment and Tourism (DEDET) in 2012. The EMP was later submitted for amendment to the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). The approved amendment was received in 2015.

A Risk Assessment was conducted in support to obtain General Authorisation for additional infrastructure and powerlines at FAD 6. This risk assessment forms the basis for the GA number 16/2/7/C121/B028 that was issued by the DWS: Vaal Proto Catchment Management Agency in 2016.

3.2.2.3 Authorizations

Various authorizations were issued for the construction and operation of the FAD 6 facility. These authorizations are available at the facility and includes the following:

- The Department of Economic Development, Environment and Tourism (DEDET) issued environmental authorization (EA) number 17/2/3 GS-6 in 2012.
- General authorization (GA) number 16/2/7/C121/B028, for additional infrastructure and powerlines at FAD 6, was issued by DWS: Vaal Proto Catchment Management Agency in 2016.
- General authorization number 27/2/2/C42/14/1, for Power line associated with the Sasol FAD 6, was issued by DWS: Gauteng Provincial Operation in 2018.

Copies of all these authorizations were made available for this study by the SSIC team responsible for the management and operation of the FAD 6 facility.

3.2.2.4 Integrated Water and Waste Management Plan (IWWMP)

The Integrated Water and Waste Management Plan (IWWMP) for the SSIC facility was developed in 2015 and the FAD 6 facility was included in the plan in 2016. This management plan has an associated action plan that is updated annually and is submitted to the DWS as part of the commitment to ensure continuous improvement in order to meet water quality objectives.

3.2.3 Interviews

Semi structured interviews with regulatory case officers at the various issuing authorities and with the Sasol specialist engaging with the regulatory bodies for authorization and licencing of the FAD6 facility were conducted, in order to establish:

a. Consideration for meeting requirements set out in the legislation that allows for dispensation.
b. Methods for implementing dispensation options from regulations.
c. Communication strategies within departments to ensure efficiency of issuing licenses and authorizations.

Therefore, the interviews were conducted with case officers and specialists that issued licenses, management plans and authorizations as follows:

- Department of Water and Sanitation (DWS) and the Sasol SHE Water Specialist for issuing the water use license number 01/C12D/CGI/4076 in 2016.
- Department of Environment, Forestry and Fisheries (DEFF)[5] and the Sasol SHE Waste Specialist for the issue of the waste management license number 12/9/11/L180410154620/6 in 2019.
- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)[6] and the Sasol Group Technology Environmental Specialist for reviewing and authorizing the original FAD 6 EMP in 2012 and the revised EMP in 2016 and for issuing the environmental authorization (EA) number 17/2/3 GS-6 in 2012.
- DWS: Vaal Proto Catchment Management Agency and the Sasol SHE Water Specialist for review of the Risk Assessment that was conducted in support to obtain General

[5] The Department of Environment, Forestry and Fisheries (DEFF) was formerly known as the Department of Environmental Affairs.
[6] Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) was, in 2012, referred to as the Department of Economic Development, Environment and Tourism (DEDET) .

Authorisation for additional infrastructure and powerlines at FAD 6. This risk assessment formed the basis for the GA number 16/2/7/C121/B028 that was issued by the in 2016.

- DWS: Gauteng Provincial Operation and the Sasol SHE Water Specialist for the General authorization number 27/2/2/C42/14/1, for Power line associated with the Sasol FAD 6, that was issued in 2018.

In order to address the research question related to the communication and interaction between governing bodies, as it pertains to this research, only five interview questions were asked, and discussions noted. The five interview questions can be viewed APPENDICES

Appendix 1: Interview questionnaire

Appendix 2: Interview concent form

Appendix 3: Ethics approval

Appendix 1.

3.2.4 Legislative review

In order to ensure efficient governance all allowances made in legislation should be considered. Efficiency is required to ensure effective prevention of over regulation. The following legislation was reviewed to evaluate efficiency:

- National Water Amendment Act, No. 36 of 1998.
- National Environmental Management Act, No. 107 of 1998.
- National Environmental Management: Waste Management Act, No. 59 of 2008.
- National Environmental Management: Air Quality Act, No. 39 of 2004.
- GN 509 of 26 August 2016: General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in section 21(c) or section 21(i).
- GNR 1159 of 10 December 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Amendments to Environmental Impact Assessment Regulations, 2010 and Listing Notices.
- GNR 544 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 1: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D.
- GNR 545 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 2: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D.
- GN 921 of 29 November 2013: National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008), List of waste management activities that have, or are likely to have, a detrimental effect on the environment.

3.3 Data analysis

All data was consolidated in order to quantify and evaluate the current level of overlap with regards the protection of various environmental receptors including air, water, waste, land and biodiversity. The study further differentiated between conditions pertaining to construction, operational and closure phases. All requirements specified in the various licenses and authorisations were transposed to Microsoft Excel in an aligned format and was then consolidated in Microsoft Power BI. Power BI is a business analytics service that allows the consolidation of imported information for visualizations through dashboards and intelligent reporting.

Data collected from the auditable conditions set out in the licences, management plans and authorisation as described in section 3.2.2 of this proposal, was analysed to determine the percentage (%) duplication that occurs across the data set pertaining to the FAD6 facility at the SSIC.

Information gathered from interviews was used to provide insight into the approaches used when evaluating the requirements set out by legislation and will also evaluate the motivation and tools used for dispensation when the option is available. Interview questions are specifically designed to gauge understanding, by both the governing bodies and business, as far as consideration for meeting requirements set out in the legislation that allows for dispensation and the methods used for implementing dispensation options when these are available in legislation. The interview answers further provided information around the various communication strategies within departments that drives efficiency when issuing licenses and authorizations that ensures the protection of the environment without additional burden to the governance of those licenses and authorizations. Evaluation of specific legislation is necessary to ensure that all legislative requirements pertaining to the process of issuing of authorizations and licenses are considered for efficient governance.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

In order to evaluate the efficiency of environmental legislation in the protection of the environment in South Africa, this research unpacked the legislation applicable to the SSIC. The research results are derived from:

- The evaluation of South African governance structures responsible with the issuing of authorisations and licenses required for the construction and operation of FADs, as well as the evaluation of South African legislation specifically pertaining to FAD6.
- Analysis of the auditable conditions set out in the licences, management plans and authorisation in order to determine the percentage (%) duplication that occurs across the data set pertaining to the FAD6 facility at the SSIC.
- Interviews conducted with specialists to gauge their approaches to, and understanding of, the requirements set out by legislation as well as an evaluation of the motivation and tools used for dispensation when the option is available.

The research results will be discussed to evaluate if the South African legislation is used effectively to ensure that all legislative requirements pertaining to the process of issuing of authorizations and licenses, and for approval of environmental management plans, are considered for efficient governance.

4.2 Evaluation of South African governance structures

The background and literature review conducted in section **Error! Reference source not found.** above showed that the South African governance structures are complex. The environmental aspects are governed through two bodies - the DWS that governs all water matters on a catchment level and the DEFF that governs waste, air, land and biodiversity matters on national, provincial and local level. From the evaluation of the various legislation applicable to the SSIC FAD6 facility and further to the review of all the acts and regulations applicable to the governance of the facility it is clear that there is a robust intent for co-operative governance of environmental resources across the various organs of state. The extent of the governance is depicted in the requirements to consult prior to making decisions that may influence aspects across the various governance structures. Co-operative governance does not however make provision for dispensation and other than one clause in Section 22(3) of the NWA that encourages dispensation, no other acts or regulations allow for it. It was evident the options and the implementation within relevant environmental

legislation, was to prevent over-regulation while efficiently and effectively protecting the environment. The evaluation of the environmental compliance conditions for FAD6 follows.

4.3 Evaluation of environmental compliance conditions for FAD6

All conditions from licenses, authorisations, permits and management plans issued to, and valid for the FAD6 facility at the time of this study, were tabled in Microsoft Excel and extrapolated into Microsoft Power BI in order to compare them and to quantify any overlap and possible over-regulation. In order to find a common measure, the conditions were grouped together into various categories.

The first comparison was the auditable versus the general (noted) conditions. It is important to understand that the number of conditions in this comparison will not be equal to the number of conditions listed in the various categories, as any one condition may be applicable to more than one aspect and therefore more than one category. An example of this would be a condition that specifies auditing. This condition will be applicable to the categories of auditing and communication as audit results will be communicated to the relevant authorities. A second consideration when looking at the results, will be that although seven (7) licenses / authorisations / management plans are currently applicable to the FAD 6 facility, not all have conditions applicable to every category specified. The categories will all be discussed as part of the results. These categories are as follows:

- Plans, Reports, Documentation and Records
- Audits
- Communication
- Competence, Committees and Socio-Economic considerations
- Access Control, Signage, Site location, Traffic/Roads and Occupational Health
- Heritage
- Structural and Design safety
- General environmental protection
- Air Quality, Dust and Fires
- Surface water protection
- Ground water protection
- Water monitoring
- Soil, Fauna and Flora protection
- Wetland and Biota protection
- Rehabilitation

4.3.1 Auditable versus general (noted) conditions

The results of this study show that all licenses, authorisations and management plans are made up of both auditable and general conditions. General conditions are those conditions of which the facility owner needs to take note, so that in the event that there are changes in legislation, in operational parameters or ownership, the condition will come into play. In other words, the business needs to be aware of these conditions so that they can be prepared if any parameters change. The current study found that there are generally far fewer general than auditable conditions as can be seen in Figure 4.1below that depicts the number of conditions per authorisation, license and management plan.

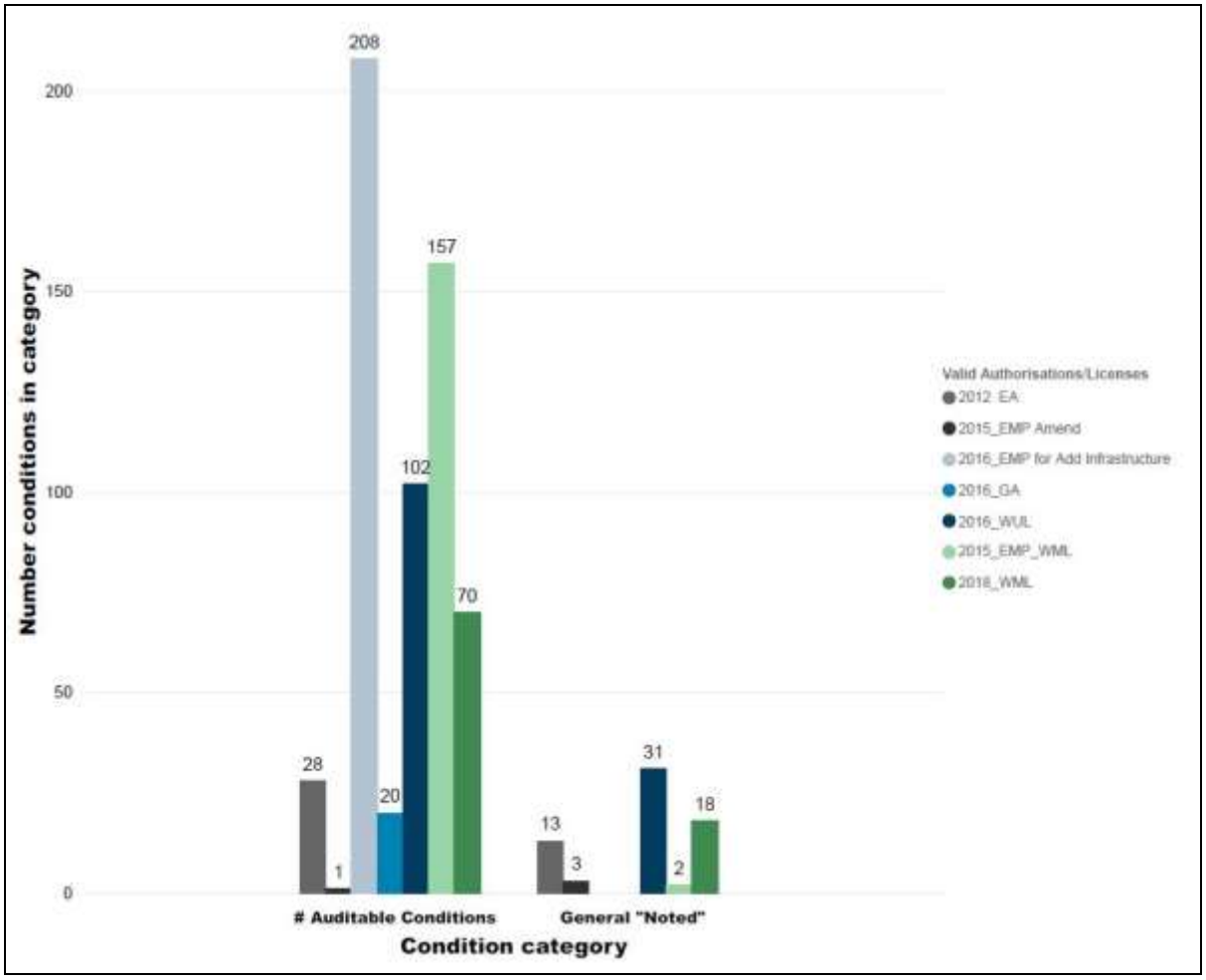


Figure 4.1: Auditable versus general conditions.

The results of the study, as depicted in **Error! Reference source not found.** above, shows that the most auditable conditions are from the EMP for the additional infrastructure and powerlines that was approved by the Department of Water and Sanitation in support of the General Authorisation (GA) for the additional infrastructure and powerlines. This EMP had no general condition and neither did the GA. The study further shows that second most auditable conditions were in the EMP for the waste management license (WML). Prior to the

issue of the environmental authorisation in 2012, an EMP was developed. This EMP was superseded by the EMP that was submitted in support of the WML in 2015. The 2012 EMP totalled 155 conditions but is no longer applicable and therefore does not form part of these applicable results. There was no clear indication as to why a different EMP was required and why the 2012 EMP was not just amended for the purpose of including the WML. The 2015 EMP was amended later that same year, so the conditions applicable to the environmental management plan totals 158 auditable conditions and five general conditions. The study showed that yet another EMP was developed in 2016 that was submitted in support for the general authorisation for the added infrastructure. The 2016 EMP totalled 208 auditable conditions. There was no explanation given as to why this EMP was developed and why the 2015 EMP was not used in support of the application. The findings suggest that three different Sasol specialist teams were involved in the development of the EMPs for the EA, the WML and the GA and that there was a lack of communication between the various stakeholders within the Sasol entity. General authorisations are typically issued when there are no water uses, dams, linings, etc., so it is rather interesting that the EMP to support the general authorisation has so many more conditions than the EMP that was submitted in support for the WML.

The WUL was issued in 2016, which means it was issued prior to the issue of the WML which was only issued in 2018. This fact is interesting, because if the WML was issued first, Sasol may have had the opportunity to apply for dispensation of the WUL based on the number of water protection conditions in both the EMP and the WML. The WUL has a total of 133 conditions of which 102 are auditable. The WML has 88 conditions of which 70 are auditable. Further comparative study below draws distinction between the number of related conditions.

4.3.2 Plans, Reports, Documentation and Records

This section of the study considered the number of conditions that require record keeping, documentation availability during audits, number of plans required for reference over and above the conditions stipulated and the number of reports that are submitted on an annual basis. The number of reports overlaps with the reporting requirements stipulated in relation to auditing and this will form the next section of this discussion. Figure 4.2 below depicts the numbers of reports, registers, plans and procedures required by the various authorisations, management plans and licenses.

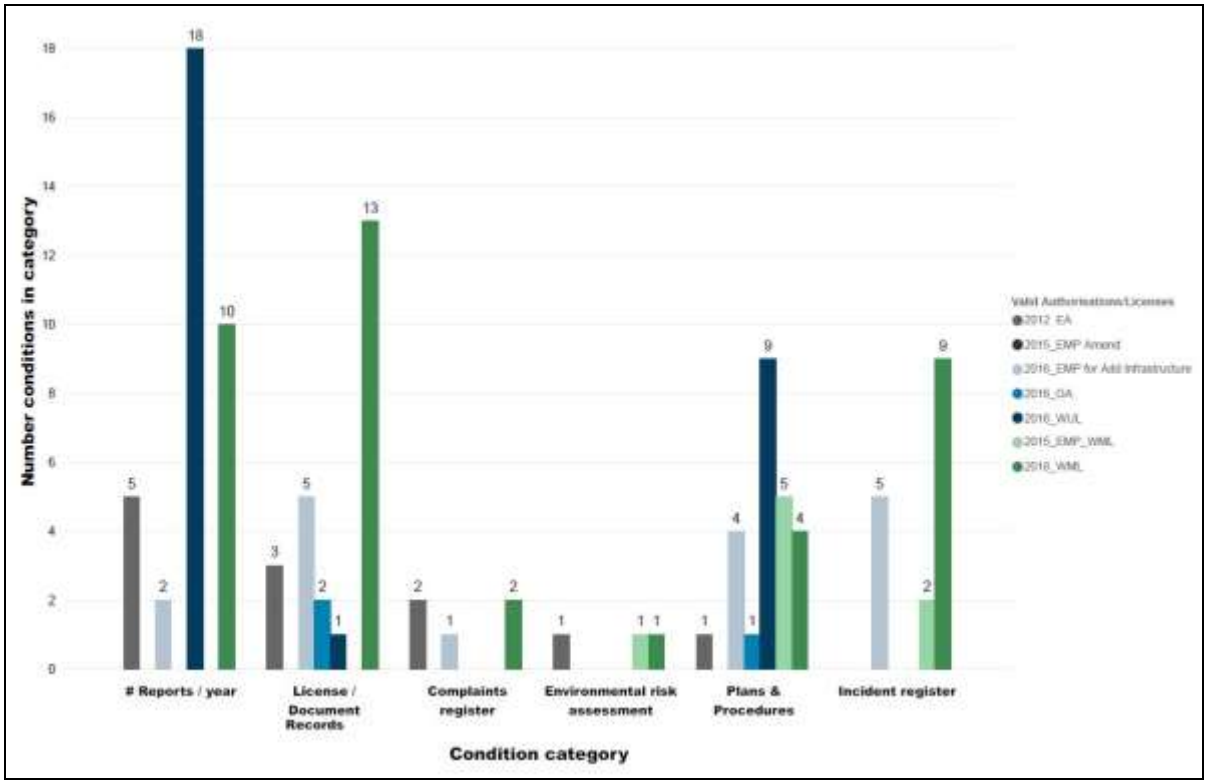


Figure 4.2: Graph depicting number of Plans, Reports, Documentation and Records.

The study graph (Figure 4.2) shows that the WUL requires the most annual reports, plans and procedures. The study indicated that the focus of the WML is record keeping pertaining to incidents as well as the availability of documentation. The WML specifically requires that all documents are kept and be available for a five-year period.

In terms of the actual plans and programs specified in the various authorisations, EMPs and licenses, the following applies. Table 4.1 lists the various plans, programmes and procedures that are required as part of the conditions set out in the authorisations, licenses and management plans. The table shows some overlap in the requirements set out in the various documents, but there is not much duplication. The requirements for the details of the plans, reports, procedures, etc. were not evaluated for the purpose of this study and the duplication throughout these can therefore not be confirmed. Further study can be considered for this purpose.

Table 4.1: List of programmes, plans and procedures listed as part of the conditions in the authorisations, licenses and management plans.

PROCEDURES / PROGRAMMES / PLANS	2012 EA	2015 EMP for WML	2015 EMP amended	2016 WUL	2016 EMP for GA	2016 GA	2018 WML
Emergency management plan and references the	X						X
Environmental impact assessment (EIA) report	X						X

PROCEDURES / PROGRAMMES / PLANS	2012 EA	2015 EMP for WML	2015 EMP amended	2016 WUL	2016 EMP for GA	2016 GA	2018 WML
Environmental management program / plan	X	X	X				X
Stormwater management plan		X					
Operating manual / Code of Practice		X					
Waste management procedure / plan		X					
Alien species eradication and control programme		X					
Surface runoff and storm water management plan		X					
Biomonitoring program		X					
Environmental monitoring, Auditing plan and programme				X			
Rehabilitation programme / plan				X	X		
Pollution identification and mitigation program				X			
Water management and water loss strategies and programmes				X			
Alien invasive eradication plan					X		
Incident management procedure					X		X
Infrastructure specific environmental management plan					X		
Authority can request additional management or monitoring plans / programs						X	
Hazardous chemicals storage procedures					X		
Borehole sampling procedures				X			
Road design and intersection procedure		X					
Service provider emergency procedures	X						
FAD 6 WUL							X
Detection monitoring programme							X
Monitoring committee TOR							X
Standard operating procedures							X
External audit reports							X

4.3.3 Audits

What gets measured gets improved upon, so audits are essential to measure the businesses compliance with the various requirements set out in the authorisations, licenses and management plans. Compliance means that there is protection of the environment. Figure 4.3 suggests that there is one post construction audit required for the environmental authorisation. The FAD6 facility is currently in partial operational as only the first phase of the construction was completed. Further phases are in construction phase as operation. This suggests that there should be post-construction audits after every construction phase, but this is not clearly defined and could create a concern between construction and operational

entities at a later stage. The EA also requires quarterly internal audits for both construction and operational conditions. The WUL requires an internal audit annually. The WML has quite a strenuous audit requirement with internal audits required quarterly and external audits on a biannual basil. Thirteen audits per annum for the same facility with various overlapping conditions. From these results it is evident that the facility is in constant preparation for an audit of one of its various licences and authorisations. One could argue that the facility should in any case be ready for an audit at any time, but the purpose of an audit is to evaluate compliance, not to place an administrative burden on the business, which in this case seems to be the case.

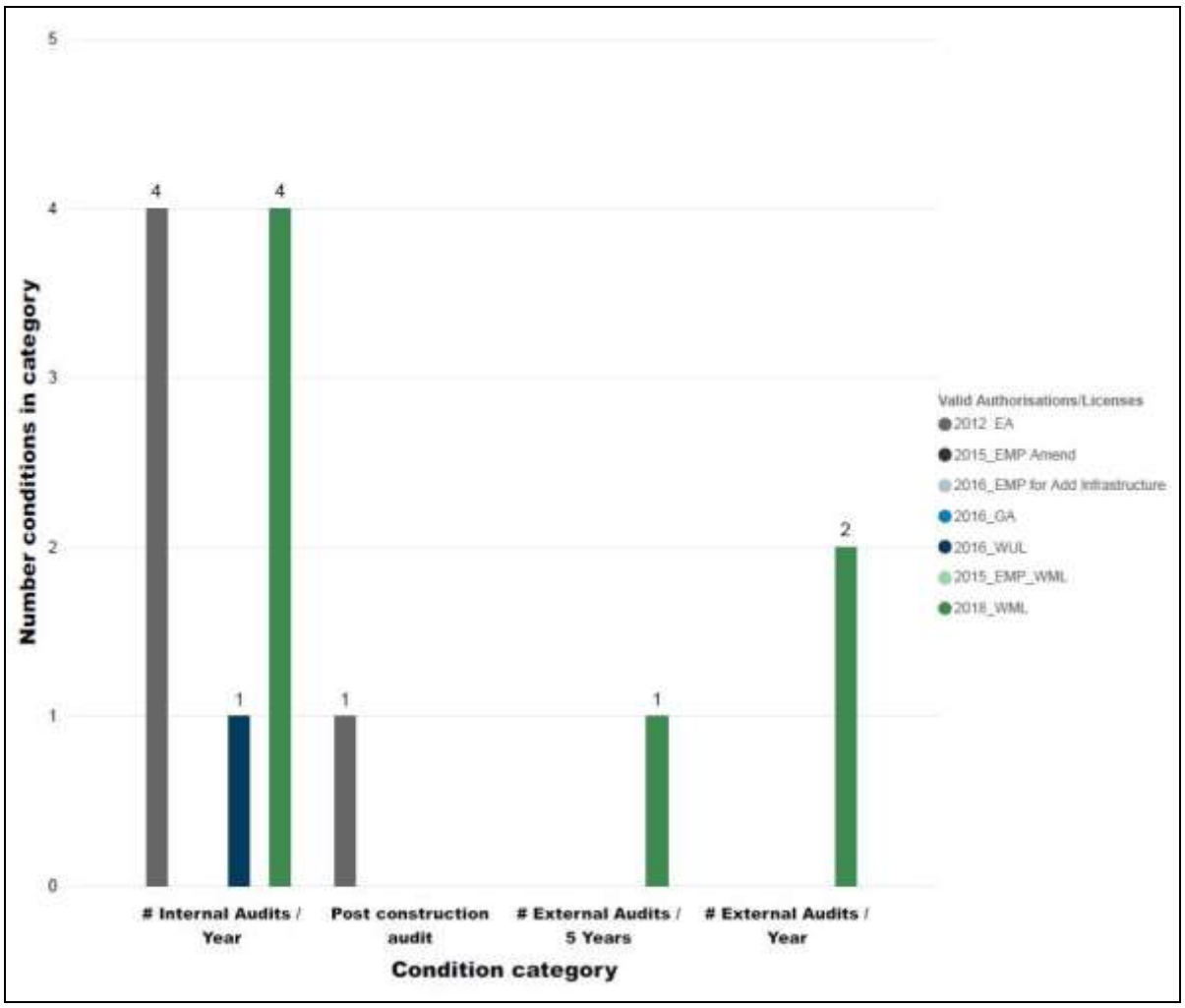


Figure 4.3: Graph depicting Audit requirements for FAD 6.

4.3.4 Communication

Results pertaining to communication, groups together all the internal and external communication requirements and includes communication with all site stakeholders regarding environmental requirements and conditions, requirements to inform all interested and affected parties and the conditions requiring communication with the various governing

bodies. The study showed that the WML has 32 communication conditions of which 23 are with the DEFF. These include communication of monitoring results, waste volumes, audits, incidents and complaints, to name but a few. Both EMPs focused on ensuring awareness of environmental conditions with contactors and on-site personnel to ensure that the various conditions set out in these documents are complied with.

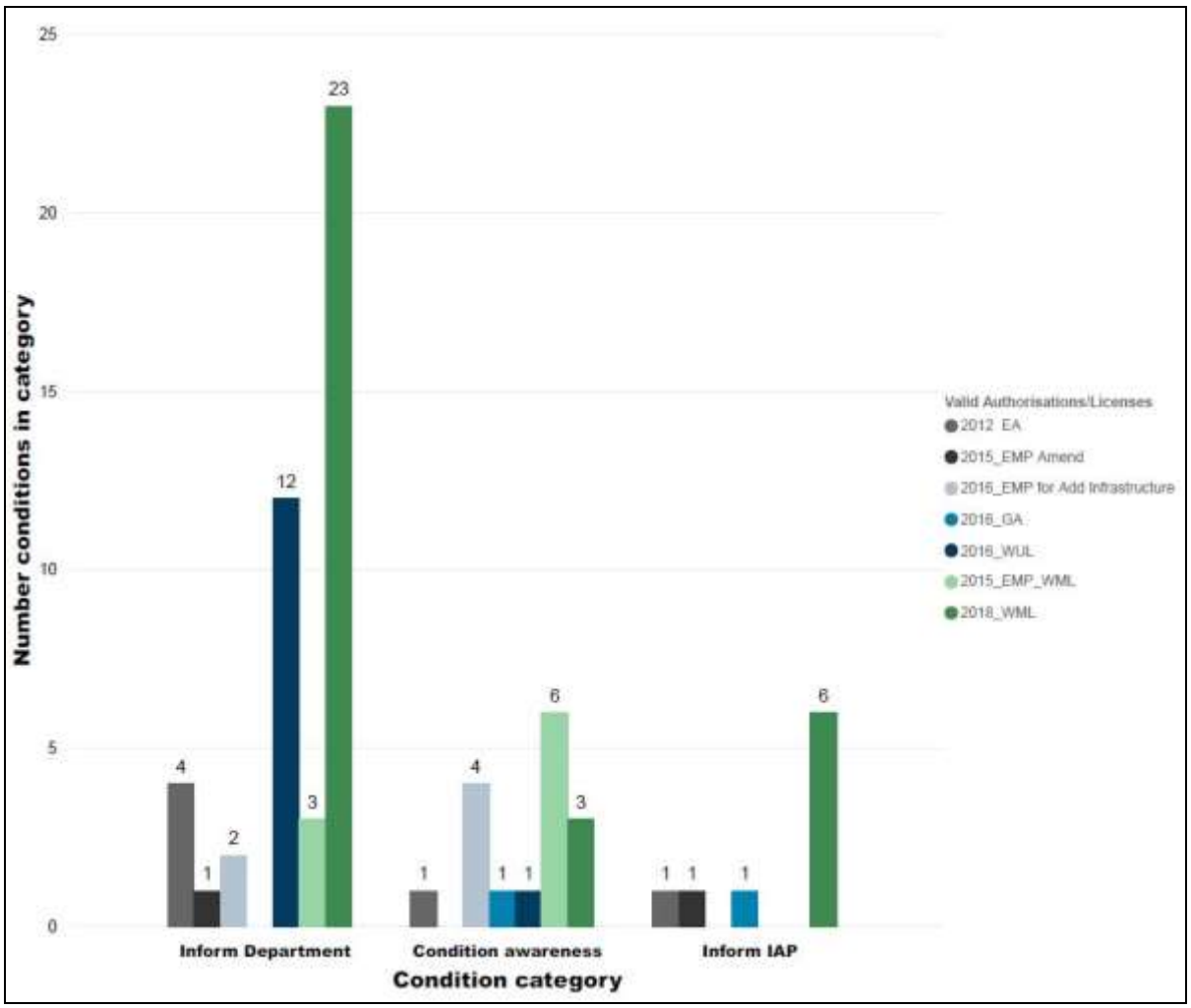


Figure 4.4: Graph showing communication requirements.

Figure 4.4 shows that there are no conditions in the GA that requires communication with the DWS specifically. This seam curious as one would expect some form of communication related to non-compliance or incidents as a minimum. The EMPs are also limited to ensure communication with on-site personnel and the department with no focus on interested and affected parties. Perhaps public participation of the EMP will prevent duplication of such document and ensure that one relevant document can be applied to all aspects of the environment, without duplication.

4.3.5 Competence, Committees and Socio-Economic considerations

The study results showed requirements for the appointment of competent staff, an environmental compliance officer and a waste management compliance officer are all requirements set out in the EA, WUL and the WML (Figure 4.5). Considering that these compliance documents were issued from different departments, it is fair that they would require representation for their specific field of expertise. If, however, the requirement for competent staff were addressed in one EMP applicable to all compliance documents, this condition would not be duplicated and therefore not over-regulated.

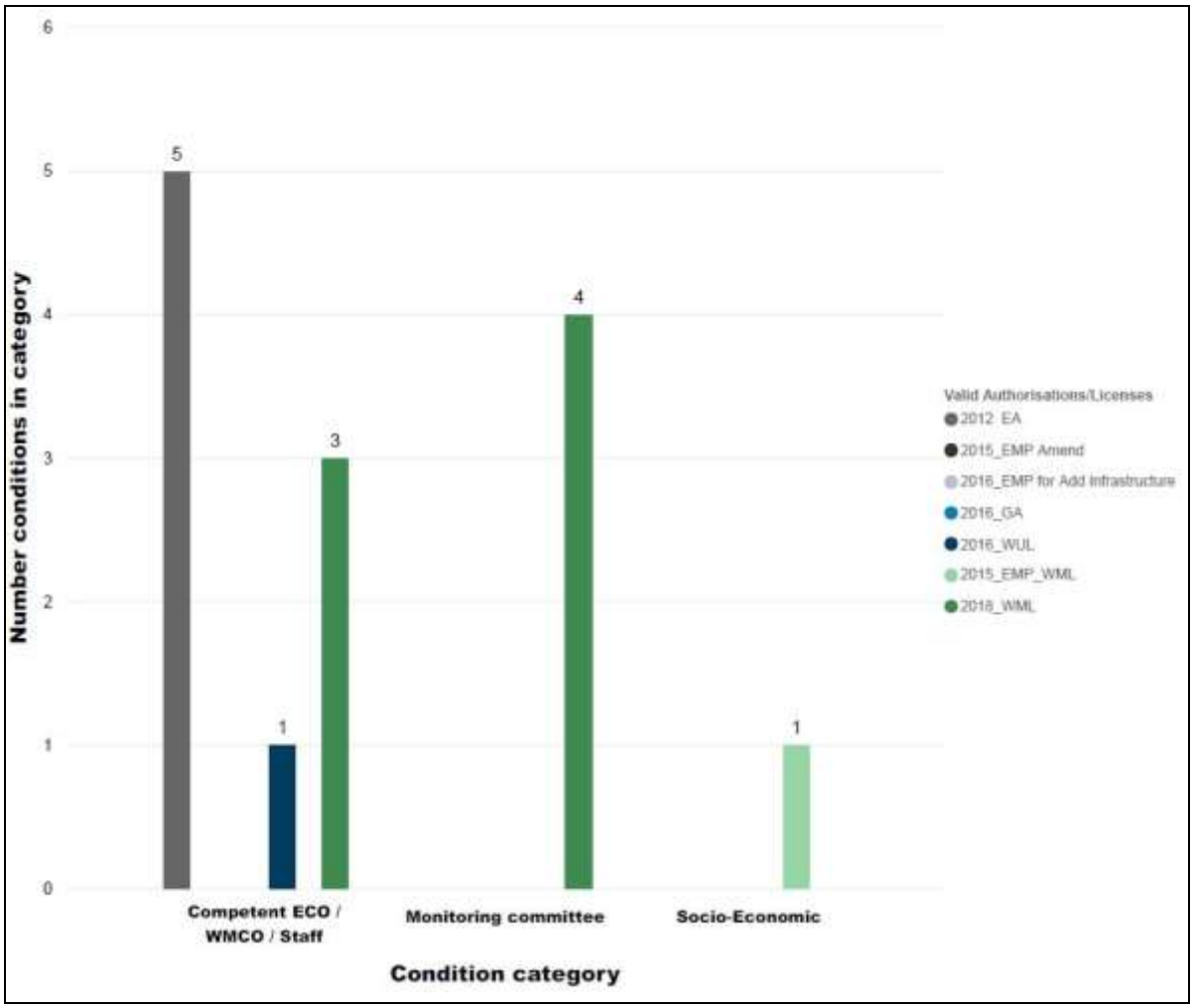


Figure 4.5: Graph showing the Competence and Committee requirements and Socio-Economic considerations.

The WML tasks Sasol with the duty to establish a monitoring committee and to put together a terms of reference (TOR) for the committee and to involve all interested stakeholders to participate in this committee. While this requirement is aimed at ensuring co-operative stakeholder engagements, it would probably have been better placed within the EMP or the EA, as this would have encouraged transparency and prevented duplication of conditions that have already been dealt with. This may well have led to the acceptance of one EMP,

and therefore no duplication of general requirements pertaining to the protection of the environment. The study further showed that, in the instance of FAD 6, there was one socio-economic condition for considering local labour when employing the FAD 6 work force.

4.3.6 Access Control, Signage, Site location, Traffic/Roads and Occupational Health

The current study found that access control for licensed facilities is critical to prevent illegal and unwarranted disposal from external parties. The EMP for general authorisation and the WML places a lot of emphasis on access control and signage to ensure all legal requirements for the facility are met. The study further indicated that the signage at the facility ensures that rules and regulations are followed by everyone that enters the facility.

No site can be operated without consideration of the OHS Act requirements that ensures compliance with the various occupational hazards that may present during the construction, commissioning, operational and closure phases of the facility. Figure 4.6 shows that the EMP for the WML addresses occupational considerations with ten such conditions while the EMP for general authorisation and the WML addresses four occupation conditions each. These conditions include noise measurement and dust exposure amongst other things. While noise and dust exposure are considered environmental aspects, the placement of occupational conditions within the environmental authorisations and licences seems a further over-regulation burden. These conditions are already dealt with extensively in the health and safety playing field, and even in the case of noise and dust, these should only be included in the environmental sense as the occupational considerations are governed in line with the OSH Act, Act 85 of 1993.

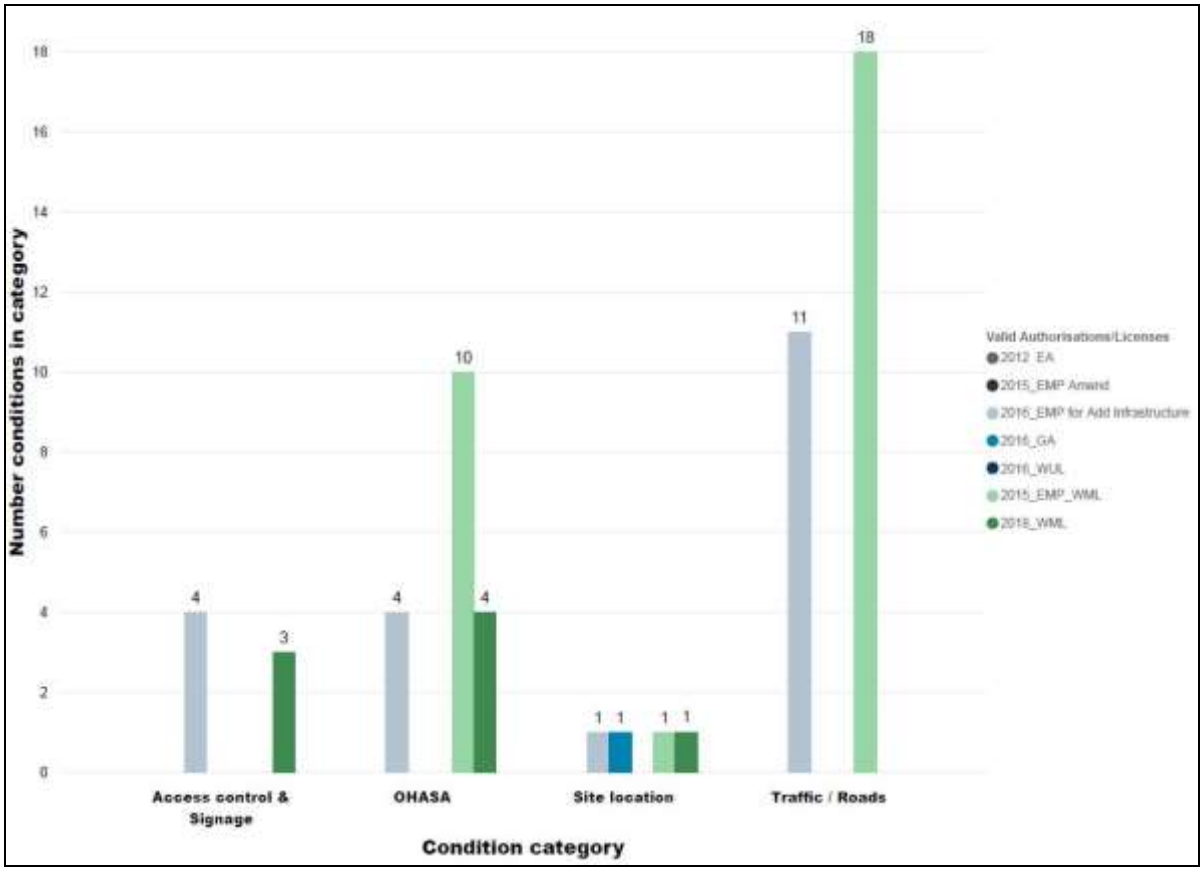


Figure 4.6: Access Control, Signage, Site location, Traffic/Roads and OHASA considerations.

Site location is an important consideration as any transgressions from the agreed site location may cause an impact of the surrounding wetlands, land and water and it is therefore important for the facility to comply with the co-ordinates agreed to with the various department. Site location conditions all require a limitation on the facility footprint and remaining within the agreed co-ordinates for the facility. But this is again a condition that could have been included in either the EMP or the EA and should not necessarily be repeated in every license and authorisation as this speaks to inefficiency.

A waste and effluent management facility such as FAD 6 has a lot of traffic movement and it is important to ensure that roads are safe to travel on, have speed limits specified for the protection of pedestrians and to minimize dust creation and that these roads are positioned and designed in such a way that they have minimum impact on the environment, especially water, soil and biodiversity. The eleven to eighteen conditions addressing this one point in the two EMPs, does seem a little excessive though.

4.3.7 Heritage

Heritage conditions, as depicted in Figure 4.7 below, shows that these conditions were only considered in the EA and the EMP for the WML. This is interesting as heritage conditions

come into play prior to and during construction when the area is assessed to ensure the fencing off of archaeological findings in close proximity to the site, grave relocation, obtaining of permit from SAHRA prior to the destruction of the sites identified in the HIA and the notification to the provincial Heritage Resources Agency if graves, fossils or any historical artefacts are identified during construction, so that a full investigation of the findings may be conducted. This again raises the question of the repeated EMP when there was already an EMP for the EA. One EMP for all licenses and authorisations should address all phases of the project from construction to closure. The WML speaks predominantly to operational conditions, so it is not clear why this EMP should contain heritage conditions. This is however an important consideration during the establishment of the site and is listed in the EA. A SAHRA permit was issued for the facility, but as the facility is established, it is no longer valid.

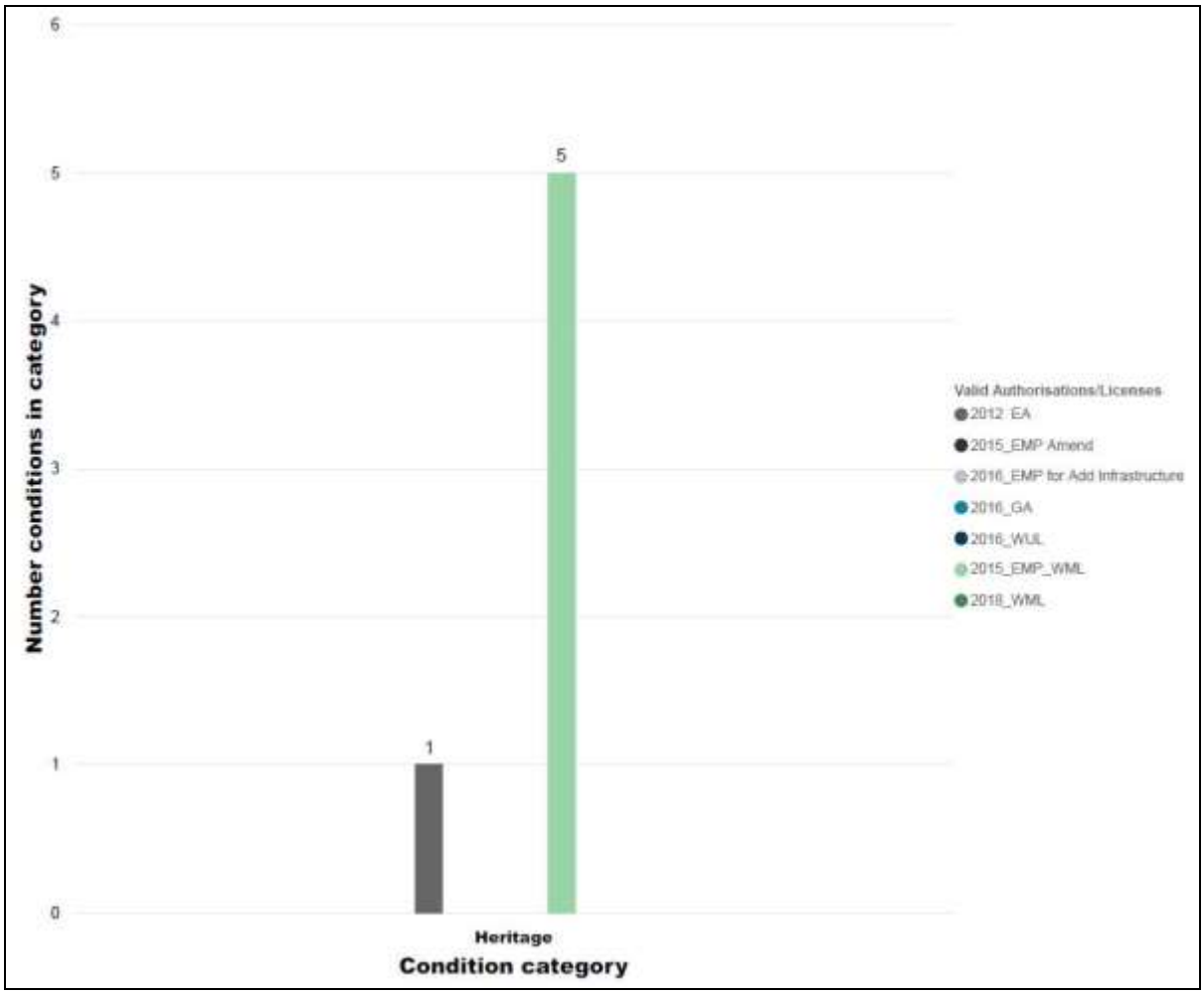


Figure 4.7: Heritage requirements as set out by EMPs.

4.3.8 Structural and Design safety

Structural and design safety conditions form a very important aspect of FADs as improper designs may elevate the risk factors in this facility. Typical risks are the loss of containment due to dam wall failure, overflow of the dam if freeboard isn't maintained, subsidence and

lining failure. As can be seen in Figure 4.8, the results indicated that the design and bank / slope stability rates as very important aspects in the EMPs and in the water use and waste management licenses. The maintenance of 0.8m freeboard to prevent overflow of the dams during the rainy season is duplicated and appears in both the WUL and the WML.

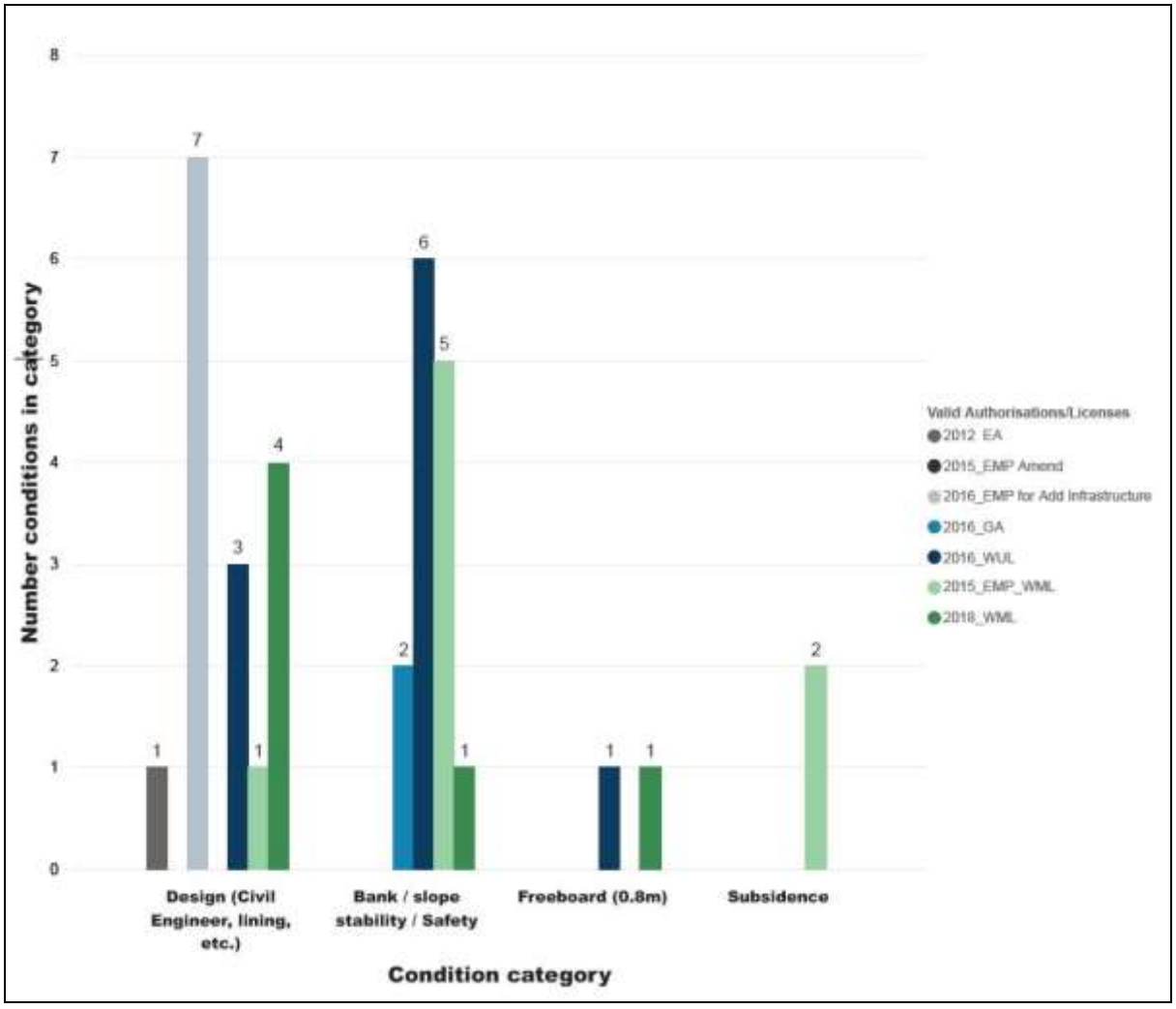


Figure 4.8: Graph depicting structural and design safety requirements for FAD 6.

Results show that the FAD 6 design includes the civil engineering considerations and the lining of the dam. The EA however only has one condition which requires the lining design to comply with the minimum requirements set by the DWS. The EMP for the general authorisation for additional infrastructure and powerlines has seven conditions pertaining to design, including culvert design, load carrying capacity of a filled trenches, backfill layering for both standard and load bearing culverts, compaction and stockpiling requirements to ensure stable trenches. The focus of the WUL focuses on dam safety, appointing a professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 1990 (Act 114 of 1990) and the sign off-of the constructed facility in line with the conditions set out in the design package and the WUL. Results therefore show that the EMP for the GA and the WUL presents detailed requirements for the safety consideration of the structures,

but this is also addressed in the appointment of a professional civil engineer, approved drawings, post construction audits and dam safety audits. Specifying, in such great detail, the specifics of dam safety, may in fact lead to the focus of this very important aspect to shift from the legal requirements to the details specified in the authorisation / licenses. This will mean that changes in regulation may be missed, making the facility unsafe. The focus of dam safety should remain with the relevant regulations and not with the authorisations and licenses. The EMP for the WML only has one condition that addresses design, and this speaks to the management options for contaminated runoff from the outer slopes of FAD 6 that will first enter the toe paddocks, then the effluent canals and the RWDs and then returned to the plant via the CAE system for reuse. The WML, like the WUL also places emphasis on appointing a registered professional Civil Engineer and the signing-off after construction. The WML further requires lining inspections where possible and repairs of damaged linings. It is fair to say that there are only a few overlaps of conditions. These conditions should give assurance, not details, to ensure that the requirements are correctly focussed.

The bank / slope safety requirements in the GA speaks to the prevention of erosion, the positioning of the facility in relation to the water sources, prevention of silting to watercourse and photographs or video recordings of the watercourse and its banks at least 20 meters upstream from the structure. The WUL addresses water run-off that may cause bank instability, stormwater discharge velocity that may cause damage to watercourse, prevention of silting and bank instability as a result of vegetation clearance, side slope ratio of 1:3 or flatter, slope / bank stabilisation and rehabilitation requirements. The EMP for the WML specifies a side slope ration of 1:3 or flatter, a starter wall ratio of 1:2.5, continuous slope rehabilitation every 5m and the side slopes must be terraced when built up by day walls in order to slow down flows that could cause depositional zones on the side slopes. These conditions are a duplication of the WUL conditions. The WML only requires that the slopes are designed to prevent erosion. Therefore, it can be seen that there is definite condition duplication in these aspects pertaining to structural and design safety of the dams. The bank / slope safety requirements ultimately also form part of the dam design and therefore, as discussed in the above paragraph, that suggests that the conditions should give assurance, not details, to ensure that the requirements are correctly focussed.

4.3.9 General environmental protection

The general environmental protection conditions include sewage management, waste disposal, bunding for storage and reaction units, hazardous substances (transport and

storage), condition of access roads and temporary crossings, construction direction and timing, site location, spillage containment and system operation and maintenance.

The current study found that sewage management is addressed in the EA and both the EMPs. The EA requires that no contaminated water be discharged to storm water or sewers and that adequate ablution and waste disposal facilities must be provided during all phases of the development. There is once again, like indicated in “Access Control, Signage, Site location, Traffic/Roads and Occupational Health” above, a lot of reference to occupational aspects, moving the focus away from the protection of the environment. The EMP for the general authorisation reflects the same conditions as the EA but also includes the management of the conservancy tanks and waste disposal to registered waste water treatment facilities. The EMP for the WML also duplicates the conditions specified in the EA but adds a point about spillages being treated as hazardous waste. This study showed a lot of over-regulation related to sewage management.

Waste disposal is covered extensively in both EMPs – see Figure 4.9. The environmental authorisation addresses the sewage waste and covers management and disposal of general waste at licensed facilities. The management of sewage waste is even duplicated within the WML. The two waste management license conditions both address the actual waste streams that are managed at the FAD 6 facility and requires that no unauthorised waste streams are disposed at the site and that any excess waste, that cannot be processed as a result of capacity issues, should be diverted to an authorised facility. These conditions are central to the operation of the FAD6 operation and are good examples of conditions that protect the environment, but they were listed as waste management conditions in the sense of general protection of the environment.

The environmental management plan for the WML lists twelve very detailed conditions related to waste management. These conditions generally include:

- The control and management of cement and concrete products and wastes on the site;
- Safe disposal certificates for all waste transported off-site from the facility during construction and operational phases;
- The cleaning and handling of sewage, wastewater, waste, fine ash, chemicals and hydrocarbon spillages at relevant and authorised waste disposal sites;
- The availability of waste receptacles for all waste types;
- Transportation requirements for all waste streams in line with respective legislation;
- Contractors undertaking activities for the development and operation of FAD 6 will ensure that the handling, storage, transportation, treatment and disposal of its wastes are

compatible with the relevant waste management practices in order to reduce safety risks to public roads.

The environmental management plan for the GA has nine conditions that addresses the following waste disposal considerations:

- Clean up and management of spillages that includes contaminated materials, oil/diesel, hazardous waste and redundant substance;
- The use of specialist waste contractors for the transportation and disposal of any hazardous waste streams to licenced disposal facilities;
- The mulching and mixing of cleared vegetation into topsoil stockpiles or disposal at approved disposal sites;
- Contractors undertaking activities for the development and operation of FAD 6 will ensure that the handling, storage, transportation, treatment and disposal of its wastes are compatible with the relevant waste management practices in order to reduce safety risks to public roads (duplication of the EMP for WML); and
- Record keeping requirements for waste disposal related documentation.

Definite duplication noted in the above conditions regarding general and hazardous waste management.

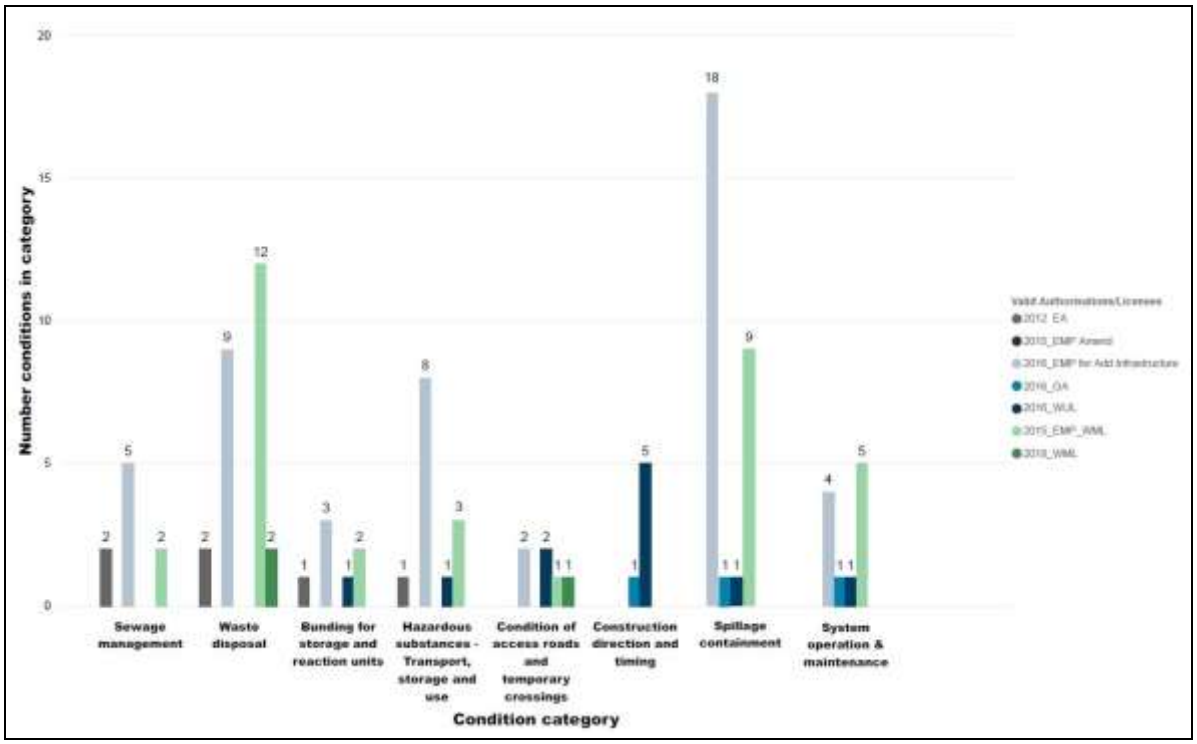


Figure 4.9: Graph showing the general environmental protection conditions.

All conditions for bunding of storage and reaction units are similar and they all require that any equipment (mobile or stationary) and materials that may leak should be stored inside

bunded areas or with drip trays to minimize pollution. Any spillages must be cleaned up immediately and disposed of at licensed facilities. From the study it can be seen that only the GA has no specific requirement for bunding, all the other licenses and authorisations addresses the bunding requirements. This does protect the environment but does not need to be addressed in all licenses and authorisation. The natural tendency by all the authorities is to include every aspect to ensure that they do not miss anything in terms of the protection of the environment and this results in inefficiency, ineffectiveness and over-regulation.

The transportation, storage and use of hazardous substances ties in with the previous section but goes into more detail and deals specifically with hazardous substances, including the use and transportation of these substances. The EMP for the WML deals with transportation and vehicle considerations but there are no conditions in the WML related to hazardous substance management. Is this not the platform where these hazards should be managed? The WUL and EA make general references to ensuring that all hazardous materials are handled in line with the relevant legislation. Again, this is good, as it does not go into the details too much, but why is this addressed in the WUL and EA and not in the WML where one would expect to see all waste related matters referenced. The study shows that the EMP for the general authorisation deals with all aspects of hazardous substances management through all lifecycles of the substances. Considering that hazardous substances are a waste management concern, it is an interesting to observe that this is addressed in the general authorisation for water use and not in the WML or EMP for the WML.

Access roads and temporary crossings feature in the WUL to ensure they are designed to prevent erosion and flooding and be repaired and maintained constantly to ensure user safety and the EMP for general authorisation deals with limiting vehicle movement to only necessary vehicles. This point is addressed in both EMPs, the WUL and the WML.

Only the WUL and the general authorisation deals with the direction that the construction process needs to take in order to minimize the impact on the environment. This is a fair consideration, as most of the impact related to the construction direction is aimed at the protection of water and associated resources, which means that the water flow direction should determine the construction direction. If this is however addressed in the GA, one can only deduct that the duplication is as because the WUL was issued prior to the GA. All work, emergency alterations and incident rectification, must start upstream and proceed in a downstream direction. The WUL further specifies that construction activities need to take place during the dry season, construction activities at or close to river crossings, streams or

wetlands should take place during low water flow periods and activities that may lead to elevated levels of turbidity of watercourse must be prevented, minimised or remediated and should take place during low water flow periods.

Spillage containment is covered in much detail in both the EMPs. These conditions, in both EMPs, are very similar and deals with any and all spillages from equipment, storage, transportation, pipelines, construction waste as well as cement and concrete mixing. These conditions deal with the effective and efficient clean-up of spillages and the disposal of the waste at registered facilities. As previously indicated, the facility would only require one EMP that should support all licenses and authorisations. There is a lot of duplication as a result of the two valid EMPs that are currently in place.

Conditions addressing system operation and maintenance are more apparent in the environmental management plans than in the licences and basically requires the prevention of incidences through good maintenance and operations, including water transfer and containment facilities such as pumps, sumps, drains and canals, the dams, etc., with specific reference to operate and maintain the infrastructure and equipment in accordance with approved Operating Manual/Code of Practice and within design limits.

4.3.10 Air Quality, Dust and Fires

No air emission license was issued for FAD 6, but there is a lot of focus on minimizing dust from the activity and road transportation. The EMP for the waste management license and the WML speak to the right of the authorities to insist that if environmental pollution, nuisances or health risks are evident on site, that the license holder must conduct investigations and implement corrective actions.

Dust management takes high priority throughout the lifecycle of the facility and the EMPs specifically place emphasis on wetting down roads and stockpiles as well as rock cladding and grassing the banks and dam slopes to encourage dust suppression – see Figure 4.10 below. If dust suppression is not possible, stockpiles may also be covered to prevent dust.

Fires in semi-arid countries are a very real risk to the environment. The EMPs are clear about fires control and ensuring that fires are only allowed in controlled / dedicated areas. This is one of the few points in the study that did not indicate over-regulated.

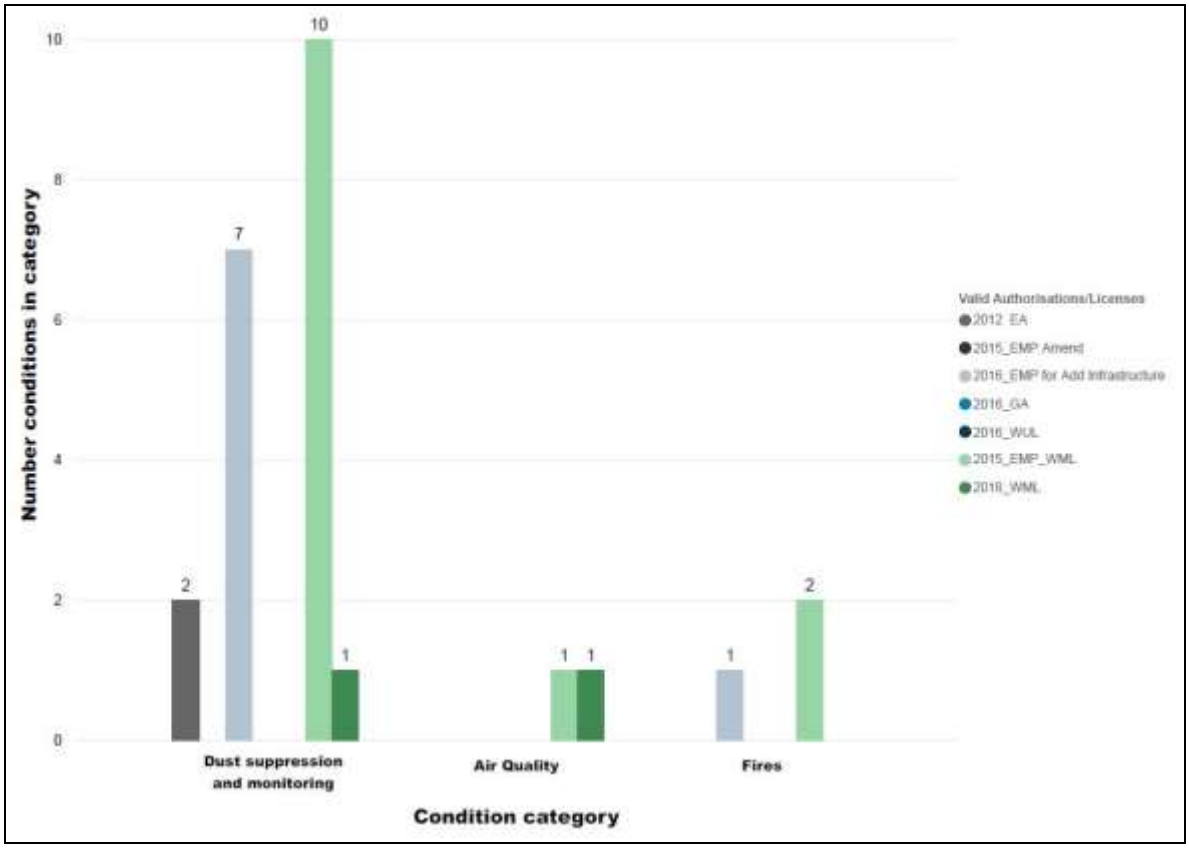


Figure 4.10: Graph showing Air Quality, Dust and Fires conditions.

4.3.11 Surface water protection

Figure 4.11 shows all conditions pertaining specifically to the protection of water. From the study it is interesting to note that most conditions for the protection of surface water are specified in the EMP for the GA and not in the WUL as one might expect. These conditions include the distance of structures from water courses, the requirement to prevent activities within the 1:100-year flood line, environmental consideration for natural drainage lines, storm water management, storm water run-off quality and dirty water segregation, the design of storm water channels and structures in water courses and the protection of streams and riparian habitat. From the graph, it is evident that the EMPs have a great role in the protection of surface water and particularly the EMP for the general authorisation. Both the EA and the WUL refers to the distance from water courses to ensure the protection of the water courses and to prevent discharge of any contaminants to the water courses.

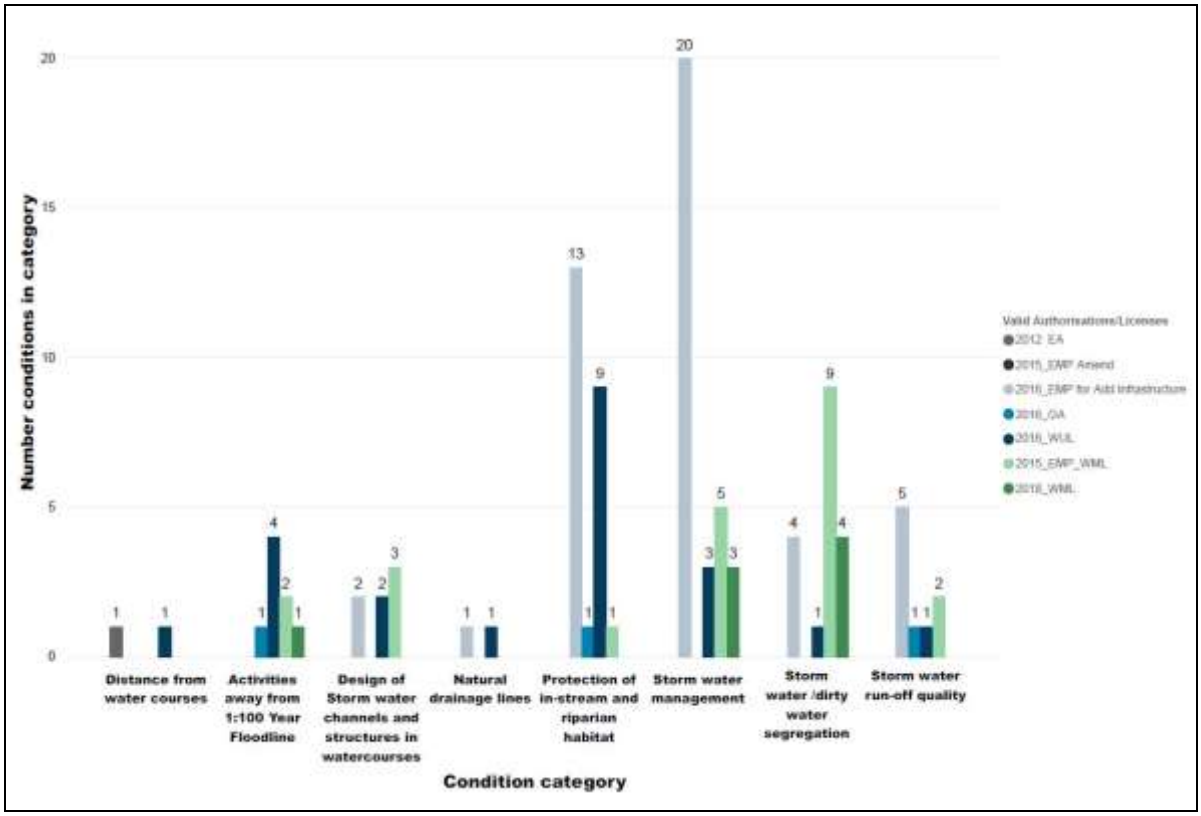


Figure 4.11: Graph showing surface water protection requirements.

The design of storm water channels and structures in watercourses is a focus for the WUL and the EMPs. The WUL is focused on design requirements for the channels and the mitigation measures to ensure that natural flow is impacted as little as possible. Both the EMPs for the general authorisation and the WML have similar design focus as the WUL, but also looks at the diversion of storm water and specifies requirements for return water into the system. For the management of water quality, the logic approach would be to look at the requirements set out in the WUL and the EMP for the EA, so it is surprising to note the number of conditions specified in the WML. The study shows definite evidence of over-regulation in the protection of surface water.

Natural drainage lines are only addressed in the WUL and in the EMP for the general authorisation. The consideration is to ensure that natural drainage lines are not impeded and that the existing lines are maintained. This however makes sense and there is no duplication related to the natural drainage lines.

The general authorisation requires that the water user must ensure implementation of mitigation measures at the FAD 6 facility to prevent detrimental changes to the breeding, nesting or feeding patterns of aquatic biota, including migratory species. Mitigation must allow for the free up and downstream movement of aquatic biota, including migratory

species, and must prevent a decline in the composition and diversity of the indigenous and endemic aquatic biota. The EMP that supports the GA includes conditions regarding the prevention of waste runoff to riparian environment through implementation of buffers, demarcation and fencing off of sensitive areas to prevent activity in those areas, six conditions related to the prevention of sedimentation and silting in riparian zones, three conditions regarding stockpiles locations away from sensitive hydrological features (including but not limited to dams, wetlands, watercourses, ponds, pans, drainage channels, etc.) and the requirement for an alien invasive eradication plan that minimize the prevents driving through riparian areas during the eradication of alien and weed species. The WUL echoes the conditions in the EMP for the GA and includes conditions such as avoiding or minimizing the impact of the development on the in-stream and riparian habitat, not disturbing fish movement, riparian vegetation should not be removed from the riparian zone but if removed, may not be stored within the riparian zone or be stored in such a way that will cause damming of water or wash-away and construction roads in or adjacent to the riparian zone must be minimised and if required, shall be aligned and managed to minimise disturbance of the riparian zone and in-stream habitats. Surely these conditions only need to appear once in the correct license / authorisation to ensure compliance? One cannot help wondering if duplicating any condition would be more effective in the protection of the environment than having a single compliance point.

Most of the focus for storm water management can be found within the EMP for the general authorisation. The EMP for the WML has five conditions and the WUL and WML has three conditions each with requirements for the protection of storm water. It is interesting to observe that the conditions in the WML are much stricter regarding storm water management than those specified in the WUL. The conditions in the WUL requires that stormwater management practices must be constructed, operated and maintained in a sustainable manner throughout the project, must be diverted from around the FAD 6 and roads and must be managed in such a manner as to disperse runoff and to prevent erosion and the concentration of stormwater flow. It also speaks to the increased runoff due to vegetation clearance and/or soil compaction that must be managed to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the stream.

The WML very specifically requires that the FAD 6 facility be constructed and continuously maintained to divert and drain all runoff water arising on land adjacent to the facility, during a 1:50 year storm event. During construction, the upslope runoff diversion drains may however be designed for a lesser precipitation event. The second condition requires that all runoff water from the facility, must be prevented from encountering leachate from the facility during

a 1:50 year rain event. As such, these facilities shall be lined in accordance with the design approved by the Department of Water and Sanitation Chief Directorate: Engineering Services dated 21 November 2014 in order to prevent pollution to groundwater. The west Return Water Dam (RWD) should, during such rainfall events, maintain a freeboard of 800mm and must be lined in accordance with the design approved by the Department of Water and Sanitation: Director General dated 12 April 2017 to prevent pollution to groundwater. Runoff water that does not comply with the water quality objectives for the facility, shall be diverted to a lined facility in accordance with the design approved by the Department of water and Sanitation chief directorate: Engineering services dated 21 November 2014 and amended as approved by the Department of Water and Sanitation: Director General dated 12 April 2017. It is noted that the DWS, in line with the NEMWA requirements for co-operative governance, was consulted during the WML application process and that the engineering services department did give inputs to and provided a positive record of decision for the design requirements of the facility.

The study further showed that nine of the conditions in the EMP for general authorisation that address storm water management specifically requires that stormwater runoff must be handled on the surface and should be directed towards natural watercourses. Six of the conditions are repeated in various sections and requires that the footprint of areas to be covered by any temporary stormwater management berms must be cleared of vegetation and topsoil, that the cleared topsoil must be stockpiled at least 100m outside of any watercourse boundaries and later be spread over the disturbed areas for vegetation to re-established. Two conditions are duplicated and requires that diversion outlets should be placed in such a way that the diverted flow enters the natural system at an acute angle to prevent the creation of turbulent flow. Stormwater should be prevented from entering the excavation by forming a berm or trench around the edges to lead water away. These berms must be compacted or tamped down sufficiently to prevent them from being washed away. Stormwater should also be prevented from entering pits.

While there is an expectation that most conditions pertaining to stormwater segregation would be found in the WUL and GA, this is not the case. The WUL has a single condition that requires that dirty stormwater must be contained in a dirty water containment facility and must not be released into the water resource. The EMP for the general authorisation specifies that no direct discharge of polluted water to the environment is permitted, other than what is permitted in the WUL, that contaminated runoff water must be routed back to the CAE system, clean water must be diverted towards the local water course and clean and

dirty water segregation must be implemented as per the FAD 6 Water Use License and the FAD 6 design basis.

The EMP for the WML however has many conditions starting with the segregation of clean and dirty water that should be implemented in line with the FAD 6 WUL and in line with the general authorisation as specified in Regulation 6 of GN R. 704. The clean stormwater should be diverted away from operational areas by cut-off channels and diversion berms and dirty water should be contained within the FAD 6 management system. FAD 6 is situated on a watershed. This means that most of the storm water falls onto FAD 6 and become contaminated. Clean water diversions have been designed for the RWD's, penstocks and around FAD 6. Clean water diversions will be constructed in order to route the stormwater into the local water courses and requires regular inspection and maintenance. Stormwater diversion control measures must be designed, operated and maintained to not spill more than every 50 years. Contaminated water may not be discharged to the environment and should be contained, and contaminated runoff water must be routed back into the FAD 6 structures to enable sedimentation and desilting. To minimise the impact of reduced flows within the downslope wetlands, the area excluded from the wetlands catchment by the dams and associated dirty water management area should be kept as small as possible.

The conditions in the WML are duplicates of the ones specified in the EMP and requires that runoff water must be managed in terms of the requirements of the latest version of the FAD 6 Water Use Licence or with such quality requirements as may from time to time be determined by the DWS. Should runoff water and leachate not comply with the specified quality requirements the dams shall be lined in accordance with the design approved by the DWS chief directorate: Engineering services dated 21 November 2014 and amended as approved by the Department of Water and Sanitation: Director General dated 12 April 2017, shall be treated to comply with the aforementioned standard prior to discharged and shall then be discharged into any convenient sewer if accepted by the authority in control of that sewer.

The quality of stormwater runoff is very detailed in the general authorisation that requires the user to ensure that in-stream water quality is measured on a weekly basis during construction, including for emergency alterations or the rectification of reportable incidents, which measurement must be by taking samples, and by analyzing the samples for pH, EC/TDS, TSS/Turbidity, and/or Dissolved Oxygen (DO) both upstream and downstream from the works. The water user must ensure that in-stream flow, both upstream and downstream from the works, is measured on an ongoing basis by means of instruments and devices

certified by the South African Bureau of Standards (SABS), and that such measurement commences at least one week prior to the initiation of the works, including for emergency alterations or the rectification of reportable incidents. The EMP for the general authorisation has three conditions that requires the construction of a containment berm around the main material stockpile to prevent stormwater to come into contact with the ash, one condition that requires the attenuation of storm water runoff at strategic points to slow down the flow velocity in an attempt to prevent the build-up of high energy sections which then causes erosion and incision of the natural watercourse and a condition to ensure that the footprint of areas to be covered by any stormwater management berms will be cleared of vegetation and topsoil. This requires the stockpiling of topsoil that will later be spread over the disturbed areas for vegetation to establish.

The WUL requires that stormwater leaving the FAD 6 facility must not be contaminated by any substances, whether such substances is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises.

The EMP for the WML states that stormwater run-off from road surfaces should be directed to clean water canals that discharge to the environment in a controlled manner and that cover material should be established on FAD 6 so that natural vegetation can be established to provide a non-contaminating surface for runoff.

It is clear from the various management plans, authorisations and licenses that storm water management is considered a high focus area and that the requirements for management and segregation of storm water take priority during all phases of the FAD 6 lifecycle. It is however not clear that specification of the same compliance point in various requirements would improve the protection of the environment. From the study result, it would appear that there is a lack of co-operative governance that leads to the duplication and over-regulation of various points related to storm water.

4.3.12 Ground water protection

Conditions pertaining to the protection of ground water are covered in sections related to monitoring and reporting, recharge as well as seepage and leachate management. The WUL puts a lot of emphasis on the protection of ground water with conditions starting with the development and implementation of a ground water management plan through all phases of the FAD 6. The license further specifies sampling points, frequency, testing, reporting and reference requirements. Groundwater quality must be monitored on a quarterly basis, samples must be taken at agreed monitoring points and should be tested by accredited

laboratories. Emergency action plan, remediation strategy and a risk assessment should be put in place to prevent groundwater quality degradation. The management and protection of ground water resources are well placed within the WUL. The EMP for general authorisation has a standalone condition around purchased rock having to be from registered and approved crushers and the EA simply requires that potential groundwater pollution must be prevented. The EMP for the WML, same as the WUL, requires that leachate collection and groundwater monitoring systems should be maintained and monitored. These conditions are a duplication of the WUL conditions addressing the same monitoring and maintenance requirements. The EMP also requires that FAD 6 must be operated to minimise seepage impacting the underlying groundwater system. Groundwater level and quality monitoring will continue to assess the effectiveness of existing management measures, and any need for further mitigation and management. The conditions in the EMP, EA and GA are the same as the conditions specified in the WUL. The study shows clear over-regulation in this regard.

The WUL requires that any groundwater recharge into the FAD 6 should be managed and the water level be monitored and kept to a minimum level to avoid the release of poor-quality water into the surface resources and ensure surface streams do not act as secondary sources of contamination during operational, decommissioning and closure phases. This is a standalone condition that can only be found in the WUL.

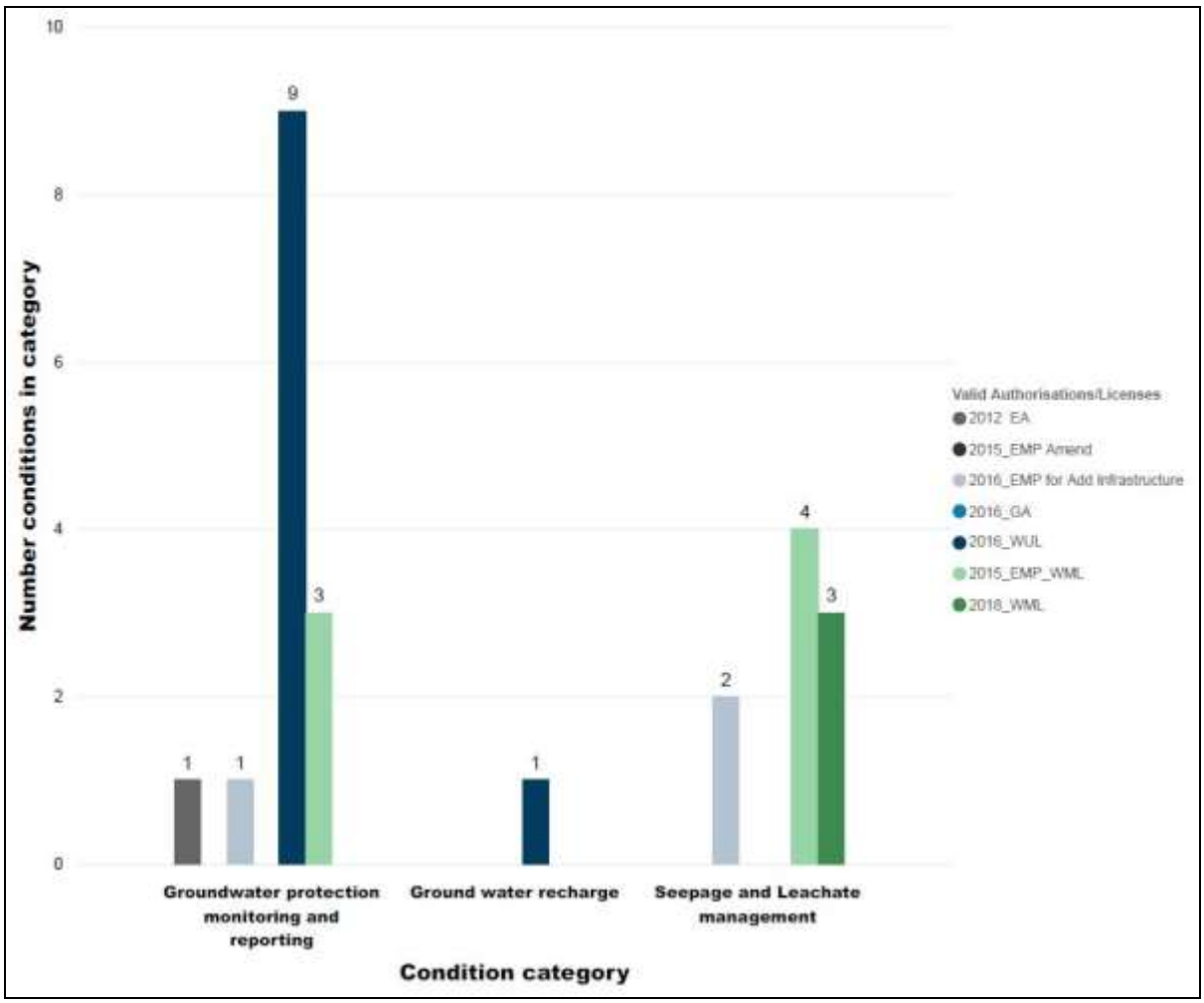


Figure 4.12: Graph showing ground water protection requirements.

Figure 4.12 above shows that seepage and leachate management is covered in only the EMPs and the WML. From the WML it is evident that the process of co-operative governance was followed. The WUL does not address seepage at all. The WUL was issued before the WML, so it is not clear why seepage was not addressed as part of the considerations for ground water management. The WML license refers to the use of a registered professional engineer for any development within the FAD 6 footprint and that all development must adhere to a class C containment barrier design as described in Regulation 636, National Norms and Standards for disposal of Waste to Landfill, dated 23 August 2013, including a lined leachate collection dam as approved by the Department of Water and Sanitation Chief Directorate: Engineering Services dated 26 November 2014 and amended as approved by the Department of Water and Sanitation: Director General dated 12 April 2017. The WML requires liner leak and failure detection monitoring on a daily basis and the reporting of an incident in the event that a leak or seepage is detected. The EMP for the license echoes these conditions but also addresses groundwater protection during decommissioning of the FAD 6 facility. The EMP for the GA specifies the inclusion of groundwater monitoring with surface water monitoring system to identify potential contamination sources, mitigation

measures and incident reporting in the event of leakages. The EMP also requires preparation of stockpile areas to minimise seepage by creating a low permeability lining through compaction of the clay layer once the topsoil is removed. This condition is not duplicated in any other authorisation or license.

4.3.13 Water monitoring

The water monitoring requirements and conditions address all surface and ground water monitoring requirements, both quality and volume, and can be seen in Figure 4.13 below. This section includes pre-construction water quality, downstream water volume and calibration, water balance and sampling frequencies. Considering the requirements specified in sections Surface water protection and Ground water protection above, over-regulation is already evident before the study as the monitoring requirements are addressed in all these sections.

The EMP for the WML is focused on wetland impact and includes conditions that will minimise the impact of structures such as roads, pipeline and power lines, on the flow of water through a wetland. The EMP also encourage minimisation of the impact of reduced flows within the downslope wetlands and that the flows that are released back into the downslope wetlands from river diversions and clean water management infrastructure should aim to mimic natural flows within the systems and should not result in concentrated high velocity flows. The EMP requires avoidance of high velocity discharges from culverts and flows under regular return events should ideally not differ significantly from natural flows within the wetland. The intent is to design all structures to have a minimal impact on the natural flows within the wetlands. The EMP for the general authorisation also focus on the wetland flow protection but specifies the inclusion and implementation of adequate stormwater controls such as earth berms, bunds and/or channels, energy dissipaters such as gabions, introduce vegetation, etc. and limiting construction vehicles and personnel movement to project specific dedicated access roads to reduce water velocity. The EMP requires biomonitoring of downstream watercourse, to assess requirements to further reduce the impacts of the FAD 6 system on the environment. The two EMPs have some duplicated conditions, but predominantly deal with different aspects of wetland protection.

The general authorisation has a different focus from the EMPS. It requires that the facility should not detrimentally affect other water users, property, health and safety of the general public, or the resource quality. These GA conditions are duplicated in the WUL as shown in the following paragraph. The GA also requires that all structures should be structurally stable, must not induce sedimentation, erosion, flooding, a detrimental change in the

quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse, a detrimental change in the quality of water in the watercourse or in the stability or geomorphological structure of the watercourse and should not create nuisance condition, or health or safety hazards. The GA further requires good record keeping through photographs and videos and this should include up and down stream areas.

Conditions in the WUL are very similar to the conditions specified in the EMPs and GA. These include ensuring downstream water users should not be impacted in terms of water quality and flow, that the activity does not negatively affect catchment yield and hydrology, that the FAD does not restrict river flow by reducing river width or obstructing river flow and that flow meters are maintained and calibrated to ensure reliable information.

So, there is definite duplication in the conditions across the various licenses and management plans, but not in all instances.

In terms of pre-construction water quality, the general authorisation requires that any existing hydraulic, hydrologic, geomorphic and ecological functions of the watercourse in the vicinity of the structure is maintained or improved upon, so it is important that good record keeping is done and this will include photographs and videos, and this should include up and down stream areas. The authorities may request the implementation of additional management measures or monitoring programmes that may be reasonably necessary to determine potential impacts on the water resource or management measures to address such impacts. The WUL requires the appointment of a competent person to evaluate the up and down stream water quality prior to commencement of construction.

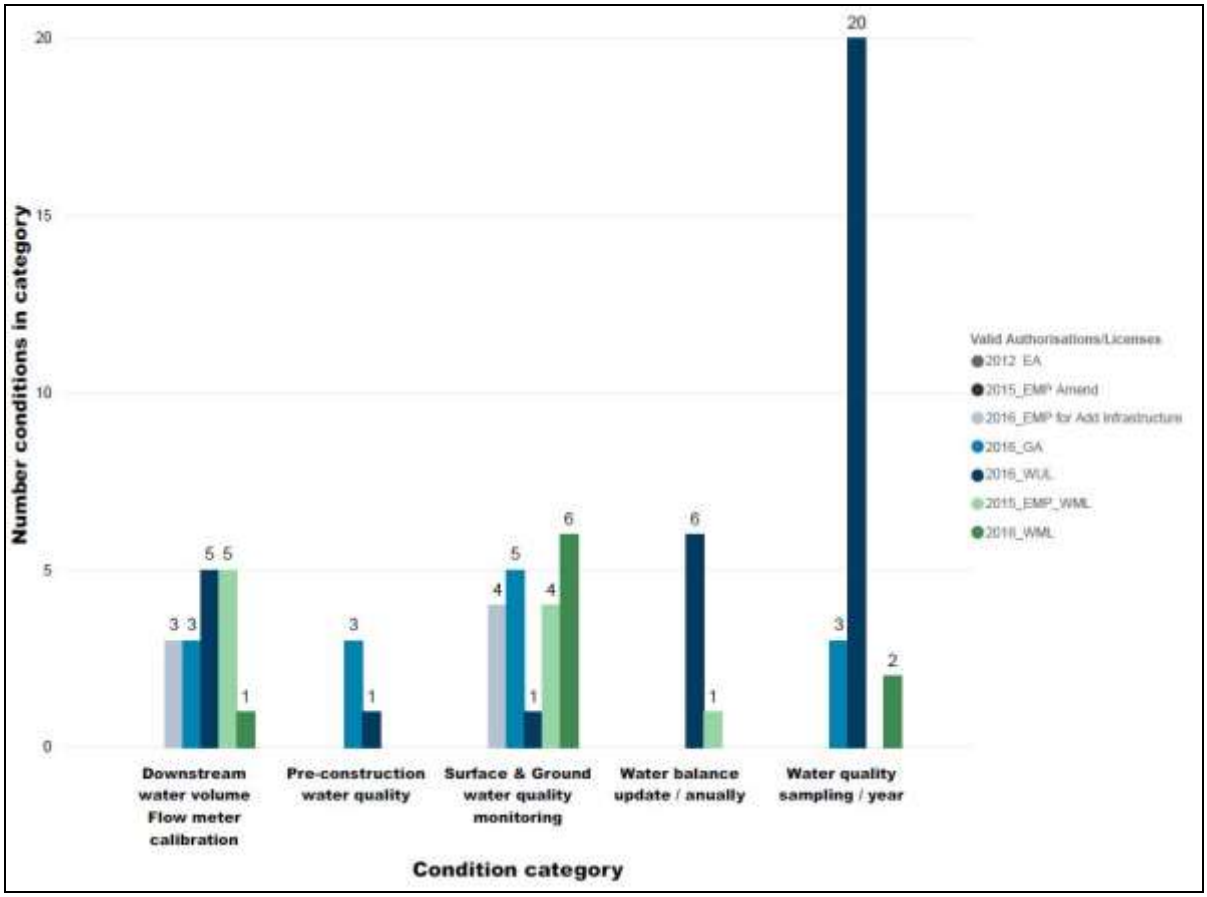


Figure 4.13: Water quality and volume monitoring requirements.

Surface and ground water monitoring is very well covered in all EMPs and licences. The EMP for the general authorisation requires the regular review of both surface and ground water monitoring data in order to reduce the impacts of the facility on the environment. It requires an understanding of the contamination sources, preventive controls and mitigation requirements.

The GA requires that the existing hydraulic, hydrologic, geomorphic and ecological functions of structures should be maintained and should be structurally stable, must not induce sedimentation, erosion, flooding, a detrimental change in the quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse, a detrimental change in the quality of water in the watercourse or in the stability or geomorphological structure of the watercourse and should not create nuisance condition, or health or safety hazards. The GA further requires good record keeping through photographs and videos and this should include up and down stream areas. The Department may require the implementation of any additional management measures or monitoring programmes to determine potential impacts on the water resource or management measures to address such impacts. The quality of stormwater runoff is very detailed in the general authorisation that requires the user must to ensure that in-stream water quality is measured on a weekly basis during construction,

including for emergency alterations or the rectification of reportable incidents, which measurement must be by taking samples, and by analysing the samples for pH, EC/TDS, TSS/Turbidity, and/or Dissolved Oxygen ("DO ") both upstream and downstream from the works. The water user must ensure that in-stream flow, both upstream and downstream from the works, is measured on an ongoing basis by means of instruments and devices certified by the South African Bureau of Standards (SABS), and that such measurement commences at least one week prior to the initiation of the works, including for emergency alterations or the rectification of reportable incidents.

The WUL only has one condition that requires continuous environmental monitoring and an audit plan/programme that must be submitted to Provincial Head for approval. This in itself suggests duplication as a monitoring and audit plan will duplicate the conditions and requirements specified in the various licenses and authorisation.

The EMP for the WML puts a lot of emphasis on the identification, prevention and mitigation of contamination to the water sources. FAD 6 is therefore aligned with the facility's surface water monitoring systems. All the conditions in the EMP for GA is repeated in this EMP including the requirement to review the surface and groundwater monitoring data collected for the operation of FAD 6. Leachate collection and groundwater monitoring must be maintained and monitored on an ongoing basis.

The WML conditions pertaining to surface and ground water monitoring are also duplicated including the requirements to make use of accredited laboratories for testing, maintaining the existing borehole network and using it to sample deep and shallow aquifers, lockable caps for boreholes, surface and ground water monitoring to be done in line with the requirements set out in the WUL and a requirement to conduct monthly sampling if the trends reveal a decrease in water quality.

4.3.14 Soil, Fauna and Flora protection

According to the study results, erosion prevention is a very high priority in the EMP for the general authorisation with 29 conditions dedicated to ensuring this aspect is addressed effectively. The water uses and waste management licenses both only have one condition for the prevention of erosion, and these are basically the same, requiring the facility owner to prevent erosion of the structure and the side slopes - efficient. The general authorisation however, while duplicating the intent or the WUL and WML, elaborates further around the implementation of erosion control measures around structures, slopes, drainage lines and

the stability of these structures, while making sure that they do not induce sedimentation, erosion, flooding, cause changes in the quality, quantity, velocity, pattern, timing, stability or geomorphological structure, water level and assurance of flow in a watercourse and that they do not create nuisance condition, or health or safety hazards. The environmental authorisation addresses the requirements to prevent erosion during and after construction and also requires backfill of any trenches that were dug during construction.

The 29 conditions of the EMP for the general authorisation goes into a lot of detail describing the specific measures for reducing erosion, including the installation of earth berms, bunds, channels, drains, energy dissipaters such as gabions, vegetation, limiting construction vehicles and personnel movement, design of outlets to natural system, sedimentation control, scour protection measures to minimize impacts on riparian zones, scouring slopes, stabilisation of topsoil stockpiles, silt fencing around stockpile storage areas, dewatering of excavations, parallel contour ploughing after soils and ameliorants have been placed and continuous monitoring of the whole site for evidence of erosion, especially after heavy rainfall events. The six conditions in the EMP for the WML infers same as the licenses and the EMP for the GA, but also adds conditions such as vegetation clearance and rehabilitation of temporary access roads to reduce the risk of erosion and any negative impacts on fauna and flora.

The protection of fauna is highlighted throughout the authorisations and management plans. Starting at the authorisation, the most important conditions are to ensure that no faunal species are disturbed, trapped, hunted or killed during the construction phase and that conservation orientated clauses are built into contracts for construction personnel, complete with penalty clauses for non-compliance. The GA echoes these sentiments, but also extends the responsibility to the water user who must ensure that measures are implemented to prevent detrimental changes to the breeding, nesting or feeding patterns of aquatic biota, including migratory species, allow for the free up and downstream movement of aquatic biota, including migratory species and to prevent a decline in the composition and diversity of the indigenous and endemic aquatic biota.

The environmental management plans address all the same conditions as stipulated in the authorisations, but adds further considerations such as the use, and strict control, of herbicides, the moving and reestablishing of endangered faunal species, lighting considerations and a requirement to follow a consultation process in the event that any red data animal species are found during the construction phase. The EMP for the general authorisation also requires the implementation of strict speed limit, installation of speed

bumps to slow vehicles down, awareness training around environmental responsibility and migration allowances for small faunal species.

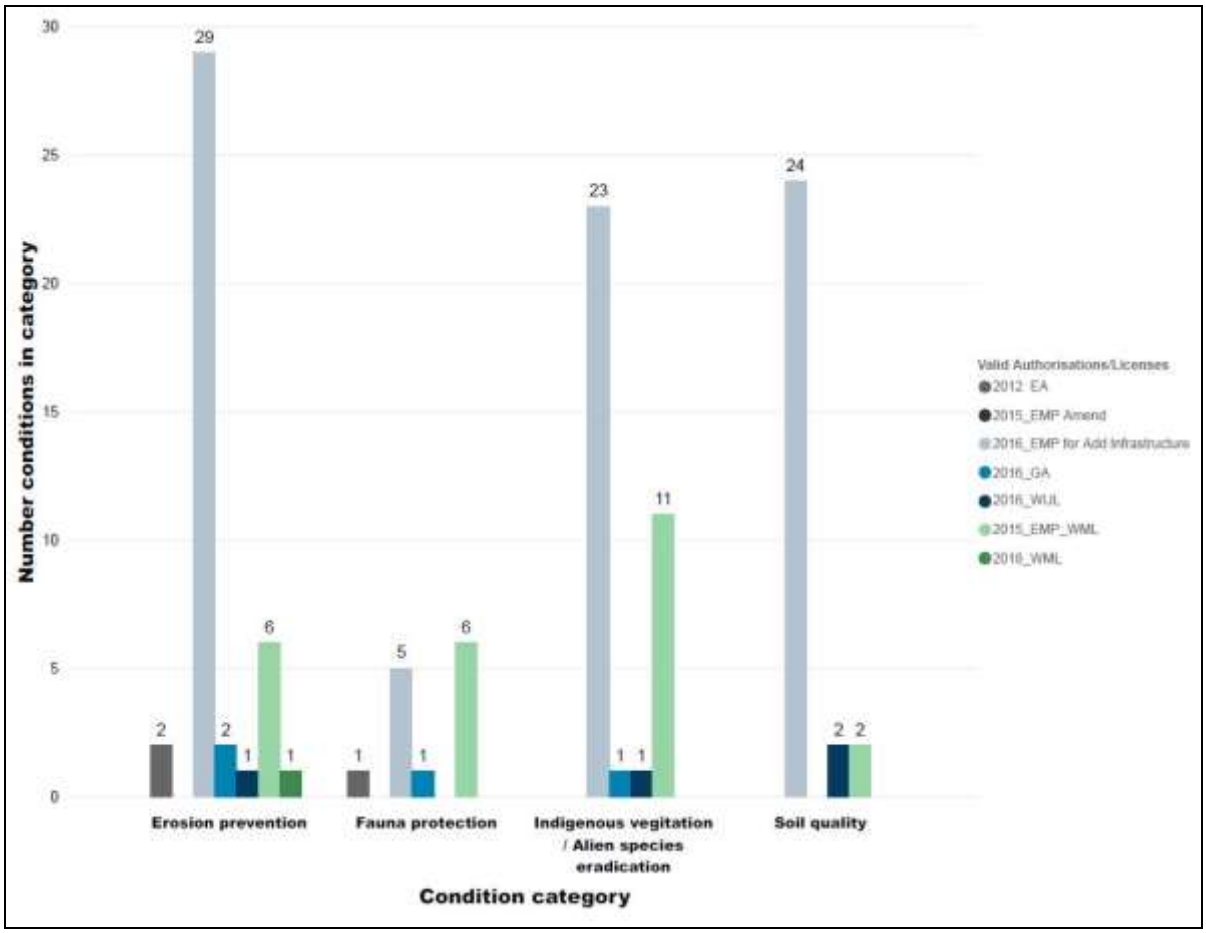


Figure 4.14: Graph depicting the protection of Soil, Fauna and Flora categories.

Indigenous vegetation and the eradication of alien invasive species are discussed at length in the EMPs. The general authorisation however requires the user to minimize the impact footprint around the works by establishing clear demarcation so that no vegetation is cleared or damaged beyond this demarcation, and that equipment and machinery is only operated within the delineated impact footprint. The WUL requires the eradication and control of alien invasive species and the WML does not specify any requirement for the control of vegetation or the protection of flora in the area.

The EMP for the general authorisation has 23 conditions related to indigenous vegetation and the eradication of alien invasive species – see Figure 4.14 above. There is a lot of repeat conditions within the EMP. Apart from the limitation of on-site vehicles, re-vegetation of exposed areas, seven vegetation clearance and disposal requirements and the reduction in sediment generated from construction activities, the water user is required to develop a sensitivity map for the study area to give consideration to the increased ecological

importance of the development area throughout the lifecycle of the development. Pesticide and herbicide use are prohibited within 100m of any wetland or water resource. Awareness training is required for all contractors. There must be migratory connectivity between sensitive areas. The EMP has seven conditions that requires the implementation of temporary storm water management berms to protect topsoil stockpiles. The EMP requires that trenches for electric cables must have a minimal impact on the area and that natural vegetation should not be disturbed. The EMP for the WML has a more specific focus on the rehabilitation and re-vegetation of the impacted FAD 6 area for soil stabilisation. This includes the development of suitable indigenous vegetation on the roadside verges and drainage courses, the development of indigenous vegetation in open ground areas, relocation of protected species, contractor awareness training and access control to the area.

Most conditions related to soil quality could be found in the EMP for the general authorisation. These conditions cover a large range, but all to protect the soil. Conditions include the use of rocks from registered crushers, stabilisation of cleared areas, limiting of site vehicles, sediment reduction, use of clay for low permeability liner where topsoil is stored, all topsoil storage requirements, stormwater management berms, limiting the excavations for electrical cables, minimal disturbance of vegetation and where soil becomes degraded, improve soil fertility through addition of ameliorants to create a sufficient growth medium for rehabilitation. Many of these conditions are duplicated within the various section of the EMP and may therefore appear several times. Only one condition appears in the WUL, but it is repeated twice. This requires that soils that have become compacted through the activities of the development must be loosened to an appropriate depth to allow seed germination. The EMP for the WML requires that a risk assessment be done for all potential contamination to soil and that such risks should be mitigated. The EMP also requires that topsoil should be stockpiled for rehabilitation purposes.

This section, dealing with the protection of soil, fauna and flora shows a lot of duplication. It is again clear that, although the various authorities have clear indication and a propensity to protect the environment, there is a clear lack of co-operative governance. If this strategy was followed, there would not be so much (or any) duplication.

4.3.15 Wetland and Biota protection

Wetland and biota protection include consideration for biomonitoring, geohydrology, vibration and also the impact of bridges and road crossings.

Biomonitoring requirements in the EMP for the general authorisation requires biannual biomonitoring and review to assess the impact of the FAD 6 facility on the environment. The WUL specifies the requirement for biomonitoring but does not specify the frequency of the monitoring. The GA in itself requires that structures should be stable, should not induce sedimentation, erosion or flooding, should not case a detrimental change in the water quality, quantity, velocity, pattern, timing, water level, the stability or geomorphological structure of the watercourse, assurance of flow in a watercourse and does not create nuisance condition, or health or safety hazards. Biomonitoring requirements in the EMP for the WML are like the other requirements but also specifies the review of the biomonitoring programme and the results of the biomonitoring, fencing and demarcation of sensitive areas, access control and the establishment of a buffer zone between the FAD 6 system and watercourses to protect the aquatic ecosystems within these sensitive areas.

Bridge piers and culverts should be cleared of debris at the start of the rainy season (September every year) and during the middle of the rainy season (January). These should be inspected and maintained on a regular basis. The WUL requires that bridges and road crossings must make provision for ecological connectivity and fish and other aquatic species requirements as determined by river ecologist or wetland expert. The GA requires that all material excavated from the bed or banks of the watercourse must be stored at a clearly demarcated location until the works have been completed.

Geohydrology considerations are noted in the GA, the EMP for the WML and the waste management license. While the specific details for geohydrology varies in these documents, they all have a clear expectation that these studies are required. The WML requires the implementation and monitoring of a borehole network for groundwater, a numerical ground water modelling and geophysical study and that the boreholes should be equipped with lockable caps. The EMP for the WUL requires that a full geological, geotechnical and stability investigation is required before development expansion takes place and that this investigation should include considerations for undermining of areas. This is the same requirement as specified in the general authorisation.

Vibration is only addressed in the WUL and requires that reasonable steps should be taken to minimise noise and mechanical vibrations in the vicinity of the river.

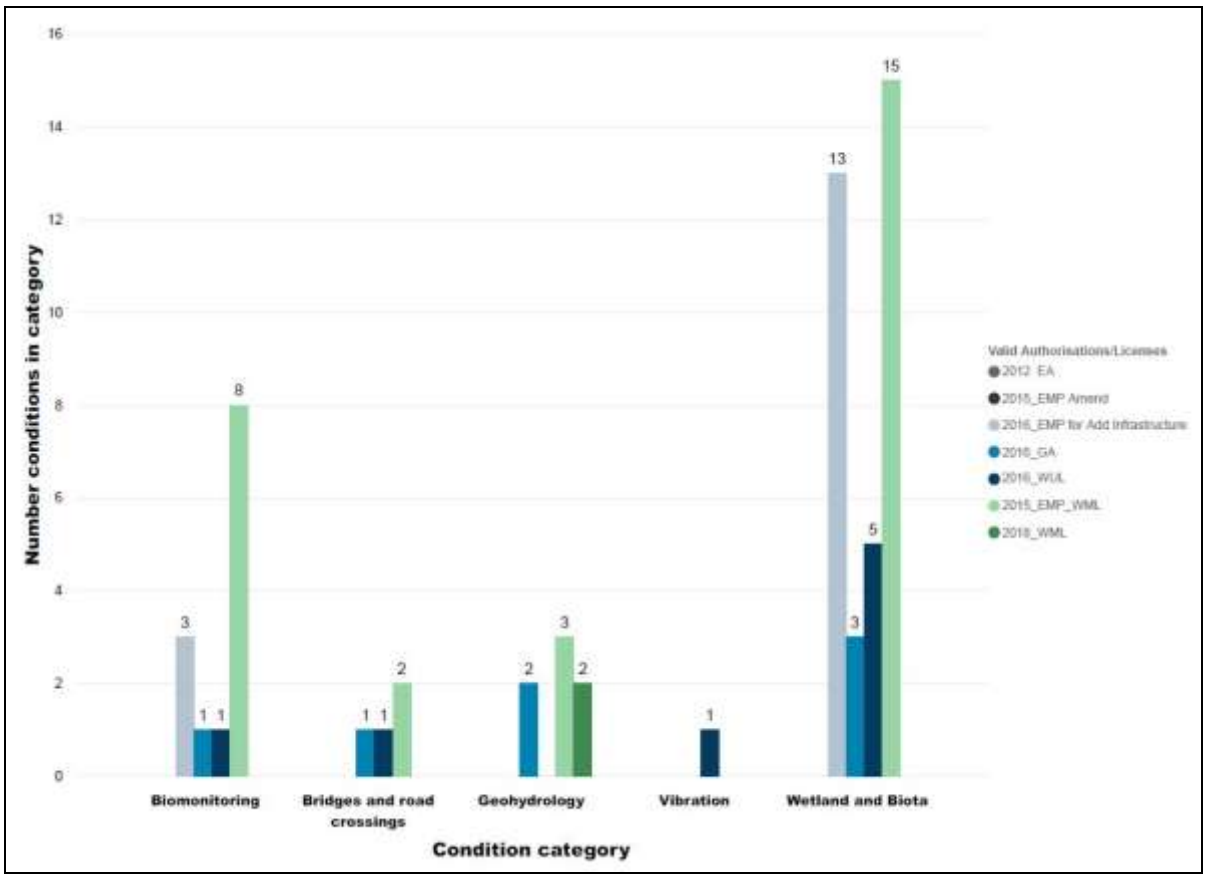


Figure 4.15: Graph showing the conditions pertaining to Wetland and Biota conditions.

As can be seen from Figure 4.15 above, most conditions in the section related to wetland and biota comes from the EMPs. The EMP for the added infrastructure that is authorised as part of the general authorisation as well as the EMP developed in support of the WML both places great emphasis on ensuring that all stakeholders are aware of the safekeeping of the wetland and that it requires protection through barriers to prevent any movement through this sensitive area and at river crossings. To aid this, wetland areas must be demarcated and barricaded as far as possible. Fencing, barricades, cables and pipelines should be designed to have a minimal impact on water flow through the wetland. Stockpiles must be located away from sensitive hydrological features such as dams, wetlands, watercourses, ponds, pans, channels, etc. These conditions are also evident in the WUL, as indicated above, and are therefore duplicated. The EMP conditions are therefore the same in both EMPs. The general authorisation differs in that it requires the implementation of preventive measures to prevent the transfer of non-indigenous biota to a site. These measures must be implemented at both existing and new structures or activities in order to prevent detrimental changes to the breeding, nesting, feeding patterns, movement and decline of the indigenous and endemic aquatic biota, including migratory species. The WUL addresses the same aspects but has additional conditions such as the movement of faunal species in wetland areas and the investigation and monitoring of springs and wetlands to ensure their continued functioning.

The results further showed a stand-alone condition of the WUL is the requirement to present ecological state, importance and sensitivity as well as Recommended Ecological Class (REC) of the Waterval River, so as to evaluate impacted tributaries and wetlands and this must not be lowered. Wetland specialist and river ecologist must determine what discharges must be made back to the natural system (tributaries, wetlands and Waterval River) and where the discharge points must be and must assist with the design of these points in conjunction with river ecologist or wetland specialist.

From the study it appears that there is over-regulation regarding the infrastructure requirements for the protection of wetland and biota, but the design requirements for discharge is well placed for the protection of the environment and prevention of environmental degradation.

4.3.16 Rehabilitation

The distribution of conditions associated with rehabilitation of ecological systems, indigenous vegetation, riparian habitat and wetland and biota are shown in Figure 4.16 below.

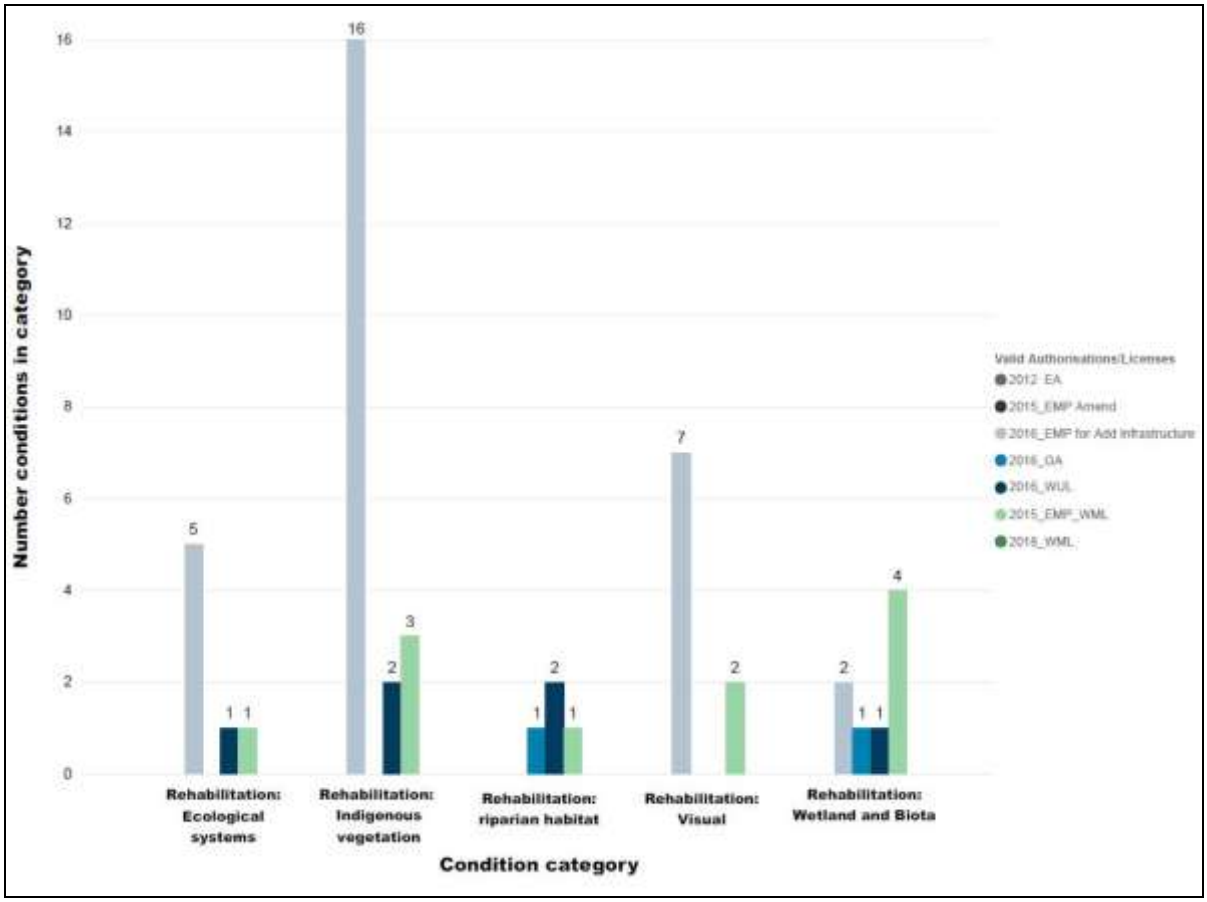


Figure 4.16: Conditions pertaining to rehabilitation of the FAD 6 facility.

Rehabilitation of ecological systems has only four conditions as the five conditions in the EMP are all exactly the same and the condition in the WUL has two requirements. It is not

clear why the four conditions are duplicated, but it was probably just a clerical error. The EMP requires that areas disturbed by linear construction activities shall be rehabilitated on completion of construction of each area. The WUL requires the impacted tributaries up to the confluence of the Waterval River must be rehabilitated into an ecological system and it must be ensured that future mining or disturbance will not further take place around the disturbed watercourses. The EMP for the WML requires that topsoil must be stripped from the FAD 6 footprint and stockpiled for further use in rehabilitation.

The study showed that the rehabilitation of indigenous vegetation makes up the biggest requirement set. The conditions in the EMP for the general authorisation requires that stored topsoil, subsoil, material and clay stockpiles should be rehabilitated and revegetated, and all areas disturbed by linear construction shall be rehabilitated. The rehabilitation will only be considered completed when the agreed standard of land use is obtained. Infrastructure and footprint rehabilitation of decommissioned infrastructure can take place post-closure. Conditions specified in the EMP for the WML and in the WUL are similar to those included in this EMP and are therefore considered duplicated.

The water user must ensure that all material excavated from the bed or banks of the watercourse are stored at a clearly demarcated location until the works have been completed, upon which the excavated material must be backfilled to the locations from where it was taken – this is a cornerstone of riparian rehabilitation as stated in the general authorisation. The WUL requires for the restoration and upgrade of the riparian habitat integrity to sustain a bio-diverse riparian ecosystem and requires annual assessment of the rehabilitation to ensure sustainability. This is reflected in the EMP for the WML, but no timeline is specified for the annual assessment, so it is assumed that this will form part of the rehabilitation plan. It is not clear why the rehabilitation goes into so much detail when and approved rehabilitation plan will be required at the closure of the facility. This could be to guide the water user to prepare for rehabilitation by also preventing damage or impact on the environment in the first instance.

Visual rehabilitation is about returning the area to reflect the pre-construction habitat, and this will include the removal of all infrastructure and profiling the landscape in accordance with pre-determined requirements. The conditions in both EMPs are very similar in their intent, but the EMP for the GA breaks the conditions down in more detail.

Wetland rehabilitation will follow the completion of construction activities a clean-up and rehabilitation program should be implemented for all wetlands located adjacent to the

construction servitudes, for a minimum of 200m upstream and downstream thereof. Some of the locally available resources, such as rocks for the construction of the gabion, may be used in the implementation of wetland rehabilitation activities. Backfilling should be done with material excavated from the construction area prior to construction. Rehabilitation of the biota would include making allowance for the migration of aquatic species, including migratory species. These conditions are all repeated in the EMP for the WML.

The results show various overlaps in the conditions for the various authorisations, management plans and licences applicable to the FAD 6 facility.

4.4 Interviews

Semi-structured interviews were conducted in order to gauge the general understanding of the consideration for meeting the requirements set out in legislation that allows for co-operative governance and dispensation, the methods used in order to implement such options from regulations, as well as the communication strategies between departments to ensure efficiency of issuing licenses and authorizations. Five interview questions were asked and discussed. The five interview questions can be viewed in Appendix 1.

The interviewees were asked to complete a consent form as part of the interview process. This consent form was approved by the Cape Peninsula University of Technology Faculty Research Ethics Committee of the Faculty of Applied Sciences in June 2020 – see Appendix 3. The consent form gives an outline of the study, advises the interviewee that the interview will take approximately one hour and gives assurance around anticipated risks associated with the interviewee participation – in this instance no risks are anticipated. The interviewee is advised of their right to stop or withdraw from the interview at any time.

The consent form (see Appendix 2) was designed to make sure that the interviewee understands the reason for their participation and to prove that they agreed to the conditions of participating in the interview. The following conditions were listed in the consent form:

- This interview will be recorded, and a transcript will be produced;
- You will be sent the transcript and given the opportunity to correct any factual errors;
- The transcript of the interview will be analysed by Broni van der Meer (student number 218086326) for inclusion in this dissertation;
- The interview transcript will be limited to Broni van der Meer, her supervisor and academic colleagues with whom she might collaborate as part of the research process;

- Interview content, summaries and quotations used as part of the academic publication will be anonymous in order to protect the identity of the interviewee;
- The recording of the interview will be deleted after the transcript has been reviewed / verified by the interviewee;
- None of these conditions will be varied without the prior approval of the interviewee.

The interviewee was further advised that all or part of the content / information gathered from the interview may be published in academic papers, on the CPUT website and in other media required, such as written or spoken presentations or during feedback sessions. The consent form also gives the contact details for the student and the CPUT research supervisor if they need to be contacted.

According to the research design, interviews were planned with the various Sasol specialist engaging with the regulatory bodies for authorization and licencing of the FAD6 facility, the consultants used throughout the processes and the regulatory case officers at the various issuing authorities. Sixteen individuals were approached for consent to being interviewed, ten conceded but only eight participated. Structured interviews were conducted with individuals as followed:

- Three specialists from Sasol were interviewed. These specialists work with the water and waste aspects for the overall facility.
- One person was interviewed from the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) licensing department.
- Three individuals were invited to participate from the Department of Water and Sanitation (DWS), two agreed, but only one participated.
- Three individuals were invited to participate from the Department of Environment, Forestry and Fisheries (DEFF), Waste Department, but after various attempts to reach them via e-mail and their contact telephone numbers, no one responded for interviews.
- Two individuals from the Sasol Group Technology department were approached to participate, but they declined to be interviewed.
- Four consultants were invited to participate in the interview process, and while all four agreed to the interview, only three participated.

Five questions were asked during the semi-structured interviews. As the persons selected for the interviews work with licensing as part of their various employment, the questions were all designed to test perception and not book knowledge of the individuals. These five questions are listed and discussed below.

4.4.1 Interview Question 1

Which governing departments are engaged with, or consulted, during the evaluation of applications for licences and authorizations?

This question relates to the various interviewee's understanding of the processes followed during licensing and authorisation and to establish the involvement of the various stakeholders that are required to participate as prescribed by the co-operative governance specified in legislation. The answers for question 1 depended on the type of application as the process of applying for an authorisation is different to the process for a water use licence, a waste management licence or a general authorisation. All the interviewees understood exactly where each application should be lodged and to whom.

The Sasol specialists indicated that they would be involved in all the application processes, but that consultants would be used for larger projects that require authorisation, management plans and licenses, such as FAD 6. There appeared to be consensus on the processes to follow for applications and all parties that were interviewed had a common understanding of what is required in terms of the process, to whom the application must be addressed and what level of co-operative governance takes place during the application process.

All waste license applications are directed at the national DEFF Hazardous Waste Management and Licensing Department. This department consults with the DWS for inputs into the license and the DWS requirements are then included as part of the WML. This process does not involve inputs from the Sasol specialists. In the case of landfills, specifically, as stated by the consultants, an integrated process is undertaken between the relevant provincial authority and the DWS engineering department. DWS will specify the water use authorization requirements and technical document requirements. The consultants predominantly get involved with DWS engineering and review panels for technical discussions around the design of landfill facilities for waste management and water use license applications. They also liaise with the Instream water use / wetland specialists that deals with section 21 (c) and (i) applications as well as the geohydrology department at DWS head office. When an application requires both an environmental authorisation in terms of NEMA and a WML in terms of NEMWA an integrated approach is followed, and one application suffices which combines both processes. A specific application form is submitted for the integrated process.

The main function of MDARDLEA is the review and approval of authorisation applications in line with the EIA regulations and in line with the EMPr that is submitted as part of the

application package. Once the work quality is reviewed and approval is granted, an environmental authorisation (EA) is signed off by the Director at head office. One of the Sasol specialist interviewees indicated some involvement with the EIA and BA processes during projects, where there has been involvement with MDARDLEA, but only dealing with the licensing officer.

WULs are typically directed at the DWS regional office (Catchment Management Agency (CMA) office or Water Management Area (WMA) office) and they will in turn schedule engagements with their in-house specialists depending on the requirements of the application (i.e. meetings with DWS specialist related to section 21 (c)and(i) water uses, wetland assessments or civil engineering specialist if it involves dams, lining requirements, etc.).

The Department of Water and Sanitation (DWS), through the National Water Act (No. 36 of 1998) and Regulation 267, require applicants to undertake public participation prior to/when applying for a Water Use Authorisation (WUA). This public participation should include engagement with other relevant governing departments. Included into this process, the DWS may request an applicant to engage with a specific government department or organisation (e.g. Council for Geoscience) depending on the nature of the WUA application. The DWS may also engage with the Department of Mineral Resources and Energy (DMRE), Department of Environment, Forestry and Fisheries (DEFF), Department of Agriculture, Land Reform and Rural Development, Local Municipality, Council for Geoscience etc., where required, depending on the nature of the WUA application (e.g. mine closure application).

These are the main governing departments associated with the environmental authorisations associated with the Fine Ash Dams (FADs) and there are several others which will be engaged with on an ad-hoc basis:

- The Department of Environment, Forestry and Fisheries (DEFF) – Waste Management Licence (WML) Applications associated with non-hazardous and hazardous wastes;
- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) – Environmental Authorisations including Amendments and WMLs associated with general wastes;
- The Department of Water and Sanitation (DWS) – Water Use Authorisations (WUA) and Amendments thereof;
- The South African Heritage Resources Agency (SAHRA) with regards to archaeological authorisations/permits;
- The Department of Mineral Resources (DMR).

From interview question 1 it was clear that all stakeholders had a basic understanding of the processes to follow for application of authorisations and licenses.

4.4.2 Interview Question 2

What allowances, if any, are made for dispensation when reviewing applications for licenses and authorizations?

This question tests to the various interviewee's understanding of dispensation options that are allowed for in legislation as well when these are applicable. Almost all interviewees asked for clarification on the question as dispensation is not a common occurrence.

The Sasol water specialist interviewees indicated that no dispensation request was lodged for the FAD 6 facility. Sasol did however engage the services of a consultant to lodge a retrospective application for dispensation with the requirement for a licence for water use for the previously unauthorised FAD 5 and previously "existing lawful water use" for FAD 4 in line with section 22 of the Water Act. Both facilities were already authorized under a WML with applicable water resource monitoring requirements. The consultant chosen to assist had previous, successful, experience with dispensation applications and indicated that Sasol had a strong case. The application was however denied out of hand by the DWS and it was requested that these water uses be included as part of the new integrated WULA for the site. The interviewees indicated that there is uncertainty on whether the dispensation request should be driven from the applicant or from the regulator. This uncertainty might be the reason why dispensation is applied so rarely to authorizations for projects. The interviewees further indicated that the DWS regional office has previously indicated that their understanding of dispensing relates to the inputs they give to DEFF during WML applications (i.e. the considerations that must be given to water protection condition as part of the WML). This does not align with the consultant and specialist views as they understand dispensation to mean that the water protection conditions listed in the WML are adequate and therefore no WUL is required. From a practical application, this would therefore require a formal letter from DWS to confirm this, but no one from the department was sure whether such communication should be issued at regional, provincial or national level and no one wanted to take the responsibility, so the application would be denied – i.e. no clarity regarding the process for dispensation. The interviewees indicated that various consultants that work with landfill applications have managed to get dispensation if a WML was in place and if this license sufficiently covered the protection of water sources. This is however not the case for

the Sasol landfill site in Secunda that has both a WUL and WML. The interviewees had not seen this first hand, but various consultants confirmed that this is the case. They may not specifically refer to it as dispensation but has a different description for this process.

The Sasol waste management team makes use of a list of waste management activities to guide them in terms of license application. There are thresholds for waste to evaluate whether a waste license application would require a full EIA or a BA in support of the application. These thresholds are typically set for treatment, recycling or disposal. General landfill would, for example require a BA, but for disposal sites that handle hazardous waste, a full EIA will be required. The waste specialist also mentioned that dispensation may be granted to do BA instead of EIA in instances where a hazardous waste facility applies for amendment, variation or for additional infrastructure and powerlines or activities. A typical example would be the extension of the Sasol MTV facility that formed an extension of the black products facility at the outside ash facility in Secunda. Extensive studies had been conducted in the past and therefore the MTV facility only required BA.

The consultants were very outspoken about the implementation of dispensation and had differing views and experiences. Although maybe not a true dispensation, Sasol has been advised by the DWS that different water uses cannot be issued for the same footprint area i.e. if there is a water use authorisation for the Fine Ash Dam (Section 21 (g), (c) and (i)), and other infrastructure are planned to be located within the same footprint, as long as it does not constitute a different type of Section 21 water use, it will not require another WUL. This does not however exempt them from applying for a WML or NEMA environmental authorisation should any listed activities be triggered i.e. Cement-Ash mixing plant triggers the need for a WML but as it is located within the FAD 6 footprint area and will most probably be located within 500 m from a wetland there is no need for an additional Section 21 (c) and (i) water use.

A notice indicating the exclusion of certain waste streams or portions of waste streams from the definition of waste for beneficial use was published during February 2020, (General Notice 85 of 3 February 2020) and the list outlined in the schedule included coarse and fine ash from the SSIC. Where existing WMLs exists, there is an opportunity to request the surrender thereof.

Further, where a WML has been issued for an activity which are located within an area for which another WML has been issued, there may be an opportunity that a WML for the decommissioning thereof may not be required. This could be applicable if closure of the

infrastructure can form part of the rehabilitation of the overall footprint area. An example thereof is the decommissioning of a cement-ash mixing plant located within the FAD footprint area.

In terms of GNR 519 of the National Water Act activities are listed that are generally authorised which do not need Section 21 (c) and (i) water use authorisations.

In one consultants experience, although they had never seen that an applicant did not need to obtain a WUA when a WML had been issued, they observed that the Department of Environmental Affairs and the DWS will not issue an authorisation before receiving comment from the other Competent authority.

One of the consultants interviewed indicated that they predominantly work with landfill (WML) applications and that this process requires the application to be lodged with DEFF and they will consult with national engineering department of DWS for a ROD. The conditions for the ROD are included in the WML and therefore there is no requirement to apply for a WUL specifically. The interviewee had an interesting experience where the DWS licensing office, that formed part of a public participation process for a landfill facility, gave inputs to suggest that a WUL should be applied for separately to the WML. The licensing official was not aware that the DWS national engineering department had already been consulted and given inputs for corrections to the designs with the aim of issuing a positive ROD for inclusion as part of the WML. The impression was that the DWS licensing officers had an inaccurate interpretation of the flow of WML applications for landfills. The licensing officials receive limited opportunities to specialize in specific fields and it seems generally that they don't have sufficient business understanding for specific sectors.

An interviewed consultant, that worked in this area pre-NEMWA, indicated that when permits were issued for waste management facilities prior to the promulgation of the NEMWA , the application for the permit was issued without consulting with water and sanitation. While NEMWA make allowances for exclusion of certain wastes from the definition of waste, it does not make allowance for dispensation or exemption and therefore DEFF does not grant such. DWS does however dispense the application for WUL if they have issued a positive ROD for a WML.

Dispensation is not commonly granted. Due to the various regulations gazetted under each legislation, the approvals are as per listing notices or water uses even if the activity to be authorised are the same. Therefore, approvals are granted per piece of legislation. Between

the DEA and the DMRE they can however agree on whom must be the lead authority on NEMA listed activities for activities not purely mining related i.e. accommodation facilities, powerlines etc. and then issue a letter confirming whom will be the lead authority in this regard.

In practice, although the National Water Act, (36/1998) allows in Section 22(3) for the responsible authority to dispense with the requirement of a licence if it is satisfied that the purpose of the Act will be met by the grant of a licence, even if you do request dispensation, it is not considered. When a waste licence is issued, the conditions are very similar to those that the Department of Water Affairs has allowed for in the Water Use Licence i.e. site security; access control; commitments of the EMPr; designation of a waste management control officer; emergency preparedness plan; permissible waste; supervision (registered professional engineer based on approved civil design drawings); GN704 requirements (freeboard and clean run-off); monitoring; record keeping and reporting; auditing (internal and external), etc. DWS will only consider dispensation for stand-alone facilities such as landfill sites and salvage yards. For more complicated facilities such as activities undertaken by mines or where there are a variety of activities, a WUL helps to cover incidents and identify sources of pollution more accurately in an integrated water management approach which does not come strongly through in other legislation. One consultant's discussions with DWS relating the requirements for issuing dispensation resulted in the following response:

- The focus must be on the spirit and the letter of the law;
- The DWS will need to determine whether the existing license can cover the facility for which a dispensation application is requested and meet the requirements of a new license in terms of monitoring and remediation;
- The current monitoring results and reports will need to be studied to assess performance;
- Dispensation is not automatically granted even if there is a ROD from the Department. The fact that there is also a Waste License does not mean that there will be dispensation of the need for a Water Use License;
- The Department is uncertain around who the decision-making body is. It is thought that the DWS Regional Office would be the decision maker as the Water Use Licenses come to the Regional Office.

A dispensation request, along with the existing license and associated monitoring, may be submitted to DWS Regional Office but the process is now more complicated as a result of the E-WULAA system which dictates that applications must be submitted only using the electronic application system and it does not allow for a dispensation application. DWS Regional Office also confirmed that when they dispense the need for a WUL they dispense to DEA. The DWS should have been consulted during the DEA approval process so that the

DWS could have dispensed to DEA. DWS Head Office does not support this view as their view is that the ROD does not dispense the need for a WUL. All and all, the effort to get a dispensation seems to be more than the effort just to obtain the water use licence.

It is the understanding of MDARDLEA that NEMA is the main legislation that informs the processes for all applications. An EA is a prerequisite to the issuing of any licenses (WMLs, AELs, WULs, etc.). The process for issuing of EAs and licenses is specified in the EIA regulations. All projects start with a basic assessment (BA) or a full EIA and is then followed by license applications. From a legal perspective the NEMA does not assert responsibility of other departments in terms of their functions, but the protocol is to allow NEMA to unfold first, as the specialist information required for their processes is the same as the information required for the EIA review and approval. Some examples of this:

- The clearing of land is not covered in the Waste Act, but it is covered in the EIA regulations, therefore an authorisation will have conditions pertaining to clearing, but the WML will not. The interviewee indicated that this is why most departments will not finalise licenses unless an authorisation has been issued first.
- The NEM:AQA requires the issue of EA prior to the issue of an AEL – i.e. it is a prerequisite.
- The activities that will require a WUL, would also require an EIA application, so it makes sense for the EIA to set the pace.

The applications (EIA, WUL, WML, AEL, etc.) may run in parallel, but licenses, where NEMA is applicable, will not be issued if an authorisation has not been granted first. While legally no process would depend on the other, this co-operative governance creates synergy and alignment.

The DWS endeavours to implement the National Water Act (No 36 of 1998) and all associated Regulations consistently across the board. However, the DWS also supports data-driven decision making, so it is possible for applicants to approach the DWS, to formally request dispensations or exemptions in writing, as long as the necessary and required motivation and supporting documentation / studies / data results are included into the request (e.g. GN704 exemption for undermining of a watercourse or wetland). The DWS, through the relevant Water User Authorisation Assessment Advisory Committee (WUAAAC), will then consider the applicant's motivation and supporting documentation / studies / data results. The DWS may also consult with other government departments in this decision-making process where necessary. The DWS will then decide regarding the applicant's dispensation or exemption request. These decisions are taken on a case-by-case basis depending on

validity of the supporting documentation / studies / data results submitted in support of the dispensation or exemption request. The DWS and DEFF also work together in terms of dispensation of licences relating to waste dumps and landfills.

From the answers given to question 2 it can be deducted that each authority wants to ensure that they cover all aspects of the Acts applicable to their area of responsibility. Although the NEMA consults with DWS, the DWS does not consult with, or needs to consult with the NEMA, resulting in limited co-operative governance. It also appears as if though there isn't clarity regarding the consultation with the DWS licensing department around their involvement during WML applications.

4.4.3 Interview Question 3

How are dispensation options, if available, implemented?

From the answers received for question 2, it becomes clear that dispensation is not common. Not only were the interviewees uncertain about the availability of the option, albeit only as listed in section 22 of the Water Act, but only one example of successful dispensation application was available for this, and this not for Sasol or the FADs. An interesting observation was however raised around other types of dispensation that may not be specifically written into law but has been left open to interpretation and deduction. One of the specialists sited that dispensation is basically only in the form of assessment requirements and that if the extensive study material for a facility is shared up front that this is definitely possible. A further important consideration is the relationship with the licensing officer. If a licensing officer is familiar with the site, and a good relationship exists, this is very possible. A trust relationship is built over time.

The Sasol water specialists indicated that dispensation is allowed for in the Water Act and may therefore be granted if there are already sufficient conditions in the WML that covers the protection of water resources. Dispensation will however not be considered if it involves section 21 (c)and(i) water uses, for which no provision is typically included in a WML. Dispensation applications will be assessed by the DWS, but it is unclear whether there are any inter departmental processes in place to identify opportunities for dispensation as part of projects where both waste and water related aspects have been identified. It is not clear how this is done as no one from DWS seems to have the same understanding of the dispensation allowance. During a previous DWS site visit, one interviewee remembers one of the waste management specialists from the DWS head office enquiring about why Sasol is applying for

a WUL when the WML is in place and covers all the requirement. When they wanted to follow up about this later, this specialist had retired. There seems to be inconsistencies regarding the interpretation of this requirement within the DWS. This would probably require a policy intervention to ensure that people within different departments interpret the law the same. DWS insisted on a license application and therefore the interviewee indicated that they did not pursue it to avoid potential disagreement with the authority that insisted on the application.

The consultants indicated that engineering approvals are typically given by the DWS, as they have the capacity within the provincial office to evaluate technical applications. The DEFF typically does not have the infrastructure to evaluate technical applications to the same extent and therefore involves the DWS for this function. Once a positive ROD is issued from DWS, this inclusion of conditions pertaining to water use, geohydrology and engineering design serves as dispensation. The DWS does not have a need to consult with DEFF for dispensation as the fields of expertise are unrelated.

One interviewee indicated that dispensation is not considered as each Department is protecting their domain and want to control the application process. Due to the impacts on surface and groundwater, the DWS will never let the control slip from their licencing process to another process and the National Water Act caters for incident of pollution. If it is to be considered, then the DWS must issue a letter to the DEA providing them the authority to approve on the DWS behalf. None of the consulting interviewees had direct involvement with any specific application for dispensation, but one of them indicated that they always get “dispensation” when applying for landfill WMLs as there are typically no WULs issued for these. The typical landfill site will “dispense” with a WUL, but only if the DWS national engineering department has issued a positive ROD and those conditions will then be included in the WML.

The interviewee from DEFF highlighted the application of a logical approach to getting authorisation and licenses in place for any project. From a developer’s perspective, there would be cost implications if they did not follow this logical approach as a license that is granted without consideration the environmental impact as applicable in the EIA regulations, will be useless without the project authorisation. The EIA application will include consulting with various specialists to ensure that all environmental impacts are considered and mitigated. A positive EIA application will therefore be indicative of a successful license application.

The DWS requires that an applicant needs to request dispensation / exemption formally in writing. This request must include supporting motivation / documentation / studies / data results. It is advised, that any such request be raised during the pre-application phase of a WUA application (or if outside the WUA process then well in advance, prior to applying), so that the DWS can advise the applicant in this regard. Often, these issues are not raised during pre-application phase, which can result in delays or rejection of applications at a later stage in the process. The DWS encourages applicants to be transparent and provide all information to the DWS during the pre-application phase in order for them to provide the applicant with advice and a clear way forward in terms of their application and potential dispensation / exemption request. If the DWS (including the WUAAAC) is satisfied with the supporting motivation / documentation / studies / data results the dispensation / exemption request can be granted. The granted dispensation / exemption will be included into the WUA, to assist and inform DWS compliance monitoring and enforcement (CME) officials when WUA auditing is undertaken.

The specialists had indicated, in question 2 above, that the E-WULAAS electronic application system does not allow for a dispensation application, so this will remain a point of discussion.

4.4.4 Interview Question 4

How does governing bodies communicate and interact, at the various levels, to ensure the effective issuing of licenses and authorizations?

Question 4 evaluates perception between stakeholders and tested interpretation of the processes followed within the various governance departments when considering applications for authorisations, licenses and EMP approvals. This question also helps us understand co-operative governance and its meaning for the various stakeholders.

The Sasol water specialists indicated that the overlap is common from waste to water and less so for water to waste. For example, the DEFF will consult with the DWS regarding water related conditions, but the DWS will not necessary require consultation with the DEFF regarding waste conditions. WULs are issued independently and are unlikely to include any other aspects. The perception is that DWS will issue a ROD when they receive a request from DEFF or MDARDLEA for inputs related to specific projects and applications for EA or WML. DWS is involved with the DEFF and MDARDLEA in the background and the regional office will consult with the relevant specialist at head office for inputs to the projects (client sometimes participate, but very seldom). DWS will issue a set of conditions that gets

included in the WML or EA. This DEFF / MDARDLEA co-operative involvement with DWS may trigger the DWS to inform around the requirements for WUL application in the event that it triggers a water use and / or is within 32m of a water source. The interviewees indicated an understanding that DEFF does not have the resources or the experience to give inputs to the management of water sources. The DWS make use of in-house specialisation. It is the opinion of one interviewee that co-operative governance from DWS to DEFF may not be practical as DEFF cannot really give any inputs related to water use.

From a WML perspective, the interviewee indicated that the level of co-operative governance would be approached differently depending on whether the application is for a new or existing license. New license applications will be submitted to DEFF and they would consult with DWS to ensure that the water related conditions captured in the WML are accurate and relevant. In the event of amendments or variations, the consultation process might not happen if the impact on water does not require substantial changes. Inter departmental co-operation comes in the form of the licensing department getting sign-off of licenses from the Chief Directorate at the Hazardous Waste and Licensing Department. The client is not involved with in any of the DEFF / DWS discussions.

The consultants indicated that the interaction between governing bodies would depend on the specific application. The various government departments follow very specific procedures and work against a checklist. Outside of what is listed on the checklist, there is no further consideration. This was evident in the experience of one specialist, where the DWS licensing department was not aware that the engineering department had already been consulted around the same project. There appeared to be a disconnect between the licensing and engineering departments within DWS – they do not communicate outside of the general procedures for WULAs. The procedure for WMLs, through the relevant provincial authority, requires the DWS licensing department to participate in the WML process as an I&AP, however, not to necessarily issue a WUL. It is therefore only in the instance of WMLs (for landfills specifically in the interviewees experience) that the DWS licensing office will be excluded from the authorisation process but would still be required to provide input as a registered I&AP / stakeholder. For all other applications that involve water uses, the application will go to the DWS licensing office. They will consult with DWS engineering, their (c)and(i) and geohydrology departments (and any other required internal departments) before going to the licensing approval committee. Once approved, they will issue WUL. In this interviewee's experience, two processes could be followed for Water Use License Applications. The general route taken is to submit a WULA to the relevant DWS office. The licensing official assesses the application and requests additional information, if required.

Once the licensing official has concluded their assessment and have consulted with the required specialists (i.e. department geohydrologist), presentations / meetings are held between the licensing official, the applicant / EAP and either the Section 21(c)and(i) office and/or the DWS engineering department, following which these departments provide their input. Following input from the above-mentioned, the licensing official will present the application to the licensing committee which will then finalise the decision on whether to grant or reject the application. The second route followed, in the case of landfills, is an integrated process between the relevant provincial authority and the DWS engineering department. When a WML is submitted for a landfill, the provincial authority submits the conceptual designs and the Draft EIA Report to the DWS engineering department, following which comments are received from DWS. Once the comments have been addressed by the project engineers it is re-submitted to the DWS engineering department together with the Final EIA, DWS will issue a record of decision (RoD) – whether positive or negative – to the provincial authority. If a positive RoD is received on the landfill design aspects from DWS, and the provincial authority is satisfied with the WMLA, an integrated WML is then issued by the provincial authority.

One consultant explained that the DWS head office is comprised of an engineering department, geohydrology department and the instream water use department that deals with section 21 (c) and (i) applications. Some applications pertaining to hazardous waste, may be directed directly to head office. The more general applications will however be channelled through the regional DWS office and if required, they will consult with head office. In this consultant's experience, there seems to be some politics between the DWS and DEFF. Maintaining good relationships are very important.

One of the consultants mentioned that there is definitely engagement between Environmental Affairs and DWS with regards the issuing of WMLs and WUAs, as overall progress is often delayed for extended times as departments are waiting on each other for feedback. While this consultant was positive about the process of co0-operative governance, another consultant indicated that the departments do not really communicate. Each Department has their own "tick-box" to adhere to. The consultants managing the projects as Environmental Assessment Practitioners (EAPs) are the actual catalysts to make communication happen on the aspects where it is required. The EAPs align information, specialist studies, requirements of each department and are managing the parallel approval processes.

One government interviewee indicated that at some point in the past, Government explored the feasibility of an integrated environmental authorisation where the rationale was informed by the desire to have one EA that integrates all aspects related to environment – i.e. integration of all licenses and authorisations. It was found that such an approach is very impractical because the timeframes relevant to the various processes and procedures, combined with the current capacity constraints, (number of people working in various government departments, expertise, technical knowledge required to carry out various functions, etc.), would not work. A diverse work force in terms of ethics, level of expertise and technical experience were thought to be problematic. The current culture and reality are that consultants will, while dealing with the evaluation of the EIA application, also invite comments and inputs from various specialists and from relevant Departments. This will form the specialist studies that supports the EIA application. In the event that the Department notes concerns, or requires clarification of technical issues, they will contact the relevant Departmental specialists to help clarify or address concerns. If the resources are not available or they lack the technical understanding required, the Department may also contact specialists outside the Department to assist them in making informed decisions regarding the success of an application.

Depending on the nature of the application, the DWS interacts with various governing departments on WUA applications when necessary. For example, mine closure applications, which require environmental authorisations and amendments or surrendering of WUAs, may necessitate consultation between the DWS and the DMRE, Mine Health and Safety Council, as well as the Council for Geoscience. These applications are discussed on a case-by-case basis, through a number of internal and external meetings, and often include intensive consultation with the applicant to ensure any concerns raised by various governing departments are addressed. In most cases environmental authorisation and WUA applications will go through Regional government offices (e.g. DWS Provincial Offices and DMRE Regional Offices), who manage these applications. These Regional Offices do consult with their Head Office counter parts when required (e.g. for mine closure applications Gauteng Provincial Office will request comment from the Mine Water Management sub-directorate, based in Head Office). WUA applications that fall over two Regions (Provincial catchments) will be assigned to, and assessed by, Head Office, in consultation with the relevant Provincial Offices.

The co-operative governance proved to have varied understanding by the different interviewees, but it is predominantly evident that the governing bodies do communicate, albeit to satisfy the requirements of a tick-box or to get specialist inputs where required. As

seen from the evaluation of the conditions pertaining to FAD 6, the level of co-operative governance seen, does not restrict or limit the propensity for over-regulation, regardless the good intent of the various governing bodies.

4.4.5 Interview Question 5

Is any specific consideration given to ensure there is no over regulation?

Yes or No? Not at all! This question is more complex than one would imagine as it speaks to the efficiency and effectiveness of environmental governance, and in fact, to the outcome of this study. The general assumption would be that governing bodies would defend the way they issue licenses and authorisation and that business would conclude that the system and site is over-regulated. This was however not entirely the case.

The Sasol water specialists indicated that a typical application for a water use authorization (WUA) is started with a pre-application meeting where the project is discussed with DWS to clarify the authorization requirements for the application (GA or full WULA). Following the pre-application meeting, the department will confirm the WUA requirements and following a site visit, supply the applicant with a list of technical documents that should accompany the application. Application is usually accompanied by these technical documents which could also include an IWWMP. When asked, the one interviewee indicated that the EMP used for DEFF applications does not form part of the WUL application process. The water use information that is provided to the DWS is used in the compilation of the WUL conditions. However, this does not necessarily minimize over-regulation from other governing bodies.

In another specialist's opinion, the interviewee indicated that no consideration is given to over-regulation. The only example where over-regulation was actively discouraged was the inputs of the DWS colleague (a number of years ago) during a site visit when he suggested a request for dispensation as there was already a comprehensive WML in place for the Sasol landfill site. The interviewee indicated that licensing officials are prone to over regulation because of the fear of under regulation. The Water Act for example also makes provision for general authorisation (GA) and this is often denied in insistence where general activities must be licensed. There are therefore definite cases of over-regulation. This is more applicable for industry. The law makes a clear distinction between general water uses and those that require licensing, but what happened in the past is that DWS preferred that certain water uses be included in an integrated water use license instead of separate GAs, even when it complied with the requirements to be generally authorised. This is not technically

correct as the purpose of the GA is to reduce the administrative burden and time for both the water user and the authorities.

The waste specialist interviewed had a different perspective related to over-regulation and indicated that there is consideration for the prevention of over regulation in the waste space. This is because the department is better able to manage the licenses and also to make it easier for business to comply. Sasol previously had many WMLs that all had their own water management, monitoring and auditing conditions, but the integration process allows for submission of only one monitoring report, audit reports at set frequencies and requirements for monitoring committees that is now aligned. As a result of the integration process, there are currently only three waste management licenses – one being for FAD 6. Another example of the consideration to minimize over regulation is the requirement for a water monitoring program. This ensures that quality, fit for purpose monitoring is done. Through the implementation of various monitoring programs, the department is trying to minimize over regulation, but the different regulating bodies makes this difficult to manage. The interviewer asked about the auditing of the EMP that was submitted with the WML application and the interviewee indicated that this is drafted by a third party and aligns with the requirements for WML. The EMP audit remains part of the EA auditing plan and is not audited together with the WML.

One consultant interviewee indicated that there is a lot of over-regulation. Stockpiles, for example, require licensing in line with the National Water Act (Section 21(g)), but could also be considered a waste product, depending on classification and the definition applied. Which would result in two separate licenses being issued for the same aspect. The interviewee indicated that FAD 6 definitely required application for (c)and(i) water uses as it is within the regulated area of a watercourse, but that the application for (g) water use around the stockpiling seemed excessive, since a WML is also required for the stockpile itself. The DWS interpretation required the (g) application due to seepage risk. However, since this facility also has a WML, the conditions relating to seepage risk could rather have been included in the WML to avoid double licensing. The interviewee indicated that the various governance departments get very involved in the process of “policing” governance after the fact. I.e. the Compliance and Enforcement office easily issue notices of intent, but they do not get involved in guiding and advising the public to assist in the compliance process prior to issuing these notices. Furthermore, it seems that no assistance is given by Departments unless a license application is submitted.

Another consultant however indicated that there is consideration for over-regulation, indicating that the DWS would ascertain what current licenses and authorisations are available prior to issuing new applications and in the instance of FAD 6 there was an application for a temporary ash crete facility that formed part of the existing FAD 6 footprint, and in light of this, there was no additional application required. In the interviewee's experience over-regulation is more prevalent in mining and larger industries and not so much in the smaller industries. This interviewee also commented that not all parties have a practical understanding of conditions and that this could cause embarrassment when having to query conditions at a later stage – for all parties. A more integrated team, with the correct resource participation, could prevent incidences where a license or authorisation condition needs revisiting at a later stage.

One of the consultants indicated that each Department manages their own requirements. The lengthy approval processes cause pressure from industry pushing the approval processes forward. The Departments never talk to one another to see if they can manage a process better, allow for dispensation or even align their requirements. Each Department focusses on what is important to them i.e. the DMR focusses on Social and Labour Plan Commitments and Financial Provisioning, the DWS seem to just have a tick-box approach where one has to submit according to a list depending which water use is applied for. Apart from the tabled water uses, the water licences for the entire industry seem to have the same standardised conditions – i.e. limited site-specific conditions. Most departments do not really seem to be aligned internally and one must constantly "sit on them" to move forward. Applications processes exceed 2 years even if the proposed activity is according to the book and the immediate right thing to do to curb contamination or implement the requirements of GN704. Even with having pre-application meetings with the Departments, views change during a process, are different between head office and regional offices, case officers move, and one sometimes end up going to the same site for the same project more than twice just to start over with a new person. The process itself becomes a struggle with extended timeframes.

Although legislation was written to prevent over regulation, the practical implementation thereof most often does not exist as it is not known how to deal with the administrative side of the environmental authorisations. One example (not specific to Sasol) is where an Environmental Authorisation needs to be granted through a provincial office as the Competent Authority but where an activity associated with hazardous waste needs to be issued with a WML from the National office. As the hazardous activity plays a minor role in the overall impact associated with the proposed project where the regional office has more

knowledge thereof, DEFF is reluctant to accept full responsibility for the Integrated Environmental Authorisation process but the delegation of the WML activity to the Provincial office is not forthcoming as the administrative process behind doing it, is not defined. This has led to the need to do two authorisation applications i.e. one in terms of NEMA and then a separate one in terms of. NEMWA.

The DWS endeavour to ensure consistency and avoidance of over regulation by ensuring that all WUAs go through the same processes, in accordance with the National Water Act (No 36 of 1998) and all associated Regulations. They indicated that various mechanisms assist in ensuring consistency, such as internal DWS specialists review applications and trying to ensure Regulation 267 is applied consistently to all the applications they review; the same WUAAAC team assess and accept / reject all Provincial applications, this again ensures that one committee are endeavouring to apply the National Water Act (No 36 of 1998) and all associated Regulations consistently to all the applications they review; where necessary Head Office sub-directorates and other governing departments are consulted and provide guidance on applications. Although it is easy to find fault with the WUA process, the e-WULAAS system has assisted the DWS greatly in terms of being able to better apply the National Water Act (No 36 of 1998) and all associated Regulations more consistently. However, it is widely acknowledged that the e-WULAAS system, as with any online application system, is a work-in-progress, and many adjustments can still be made to keep improving the system. It is also well known that the DWS needs to continually improve their procedures in order to process WUA applications more quickly, and the WUA team are continually working to streamline procedures and better capacitate the WUA officials and teams to aid in this improvement.

The MDARDLEA indicated that there is a general concern from the public that the environment is over-regulated. Environmental legislation must be complied with and government has put in place a number of initiatives to combine legislation, but there is still a lot of fragmentation. E.g. Prior to the amendment of the MPRDA, applications for mining were directed to both the MPRDA and to the provincial department for EIA in line with NEMA requirements. All mining applications are now channelled through MPRDA but using the EIA process. The current challenges are that the DWS, DEFF, various sections within DEFF such as waste, municipal bodies dealing with air emissions, etc. all have their own mandates and procedures which does still lead to over-regulation. Over-regulation is also happening because developers need various authorisations before they can start development fully. The interviewee recommended that there should be one department that includes MPRDA, DEFF, DWS and all environmental regulating bodies, so that application have to flow through

all Departments (sub-directorates) to minimize duplication. The current separation of power and the different departments overseeing environmental management presents another research problem.

4.5 Summary

The South African governance structures are complex in that environmental aspects are governed through two bodies - the DWS govern all water matters on a catchment level and the DEFF governs waste, air, land and biodiversity matters on national, provincial and local level.

From the evaluation of the various legislation applicable to the SSIC FAD6 facility and further to the review of all the acts and regulations applicable to the governance of the facility it is clear that there is a robust intent for co-operative governance of environmental resources across the various organs of state. The extent of the governance is depicted in the requirements to consult prior to making decisions that may influence aspects across the various governance structures. Co-operative governance does not however make provision for dispensation and other than one clause in Section 22(3) of the NWA that encourages dispensation, no other acts or regulations allow for it. It was evident the options and the implementation within relevant environmental legislation, was to prevent over-regulation while efficiently and effectively protecting the environment.

It can further be concluded that the different Sasol specialists involved with licensing and authorisations do not consult across their function in order to minimize duplication. More efficient communication between the various stakeholders within the Sasol entity will go a long way in reducing instances of over-regulation.

The study showed that conditions therefore does not always focus on assuring the protection of the environment and on the relevant regulations that should govern the protection of the environment, but rather on details that may cause non-compliance in the event that regulations and requirements change.

The evaluation of the conditions specified for FAD 6 shows a lot of over-lap in the seven (7) licenses, authorisations and management plans that are currently applicable to the FAD 6 facility, not all have conditions applicable to every category specified. Table 4.2 shows the total number of conditions evaluated as part of this study and the first distinction made is between the number of conditions that are auditable and general (noted).

Table 4.2: Summary of number of applicable conditions for the study.

Issued for FAD6	By	Issued	Reference number	Total Conditions	Auditable	Noted
Waste Management License	DEA	2019 (2018)	12/9/11/L180410154620/6	**89**	**70**	**19**
Approved EMP in support of EA for the proposed construction of FAD 6 at SSIC Mpumalanga Province	DEDET	2015	WSP Reference number: 477473 FAD 6 FEIAR	**159**	**157**	**2**
Water Use License	DWS	2016	01/C12D/CGI/4076	**133**	**102**	**31**
Fine Ash Dam (FAD 6) additional infrastructure and powerlines - Risk Assessment for General Authorisation	DWS: Vaal Proto CMA	2016	16/2/7/C121/B028	**20**	**20**	**0**
EMP for FAD 6 additional infrastructure and powerlines - Risk Assessment for General Authorisation	DWS: Vaal Proto CMA	2016	16/2/7/C121/B028	**208**	**208**	**0**
Amendment of EMP for the proposed FAD 6 at SSIC Mpumalanga Province	DARDLEA	2015-06 Granted 2015-08-28	1/3/1/16/5 G-01	**5**	**1**	**4**
Environmental Authorisation for the proposed construction of FAD 6 at SSIC Mpumalanga Province	DEDET	2012-10-08	17/2/3 GS-6	**41**	**28**	**13**
				655	**586**	**69**

The categories evaluated as part of this study included:

- Plans, Reports, Documentation and Records
- Audits
- Communication
- Competence, Committees and Socio-Economic considerations
- Access Control, Signage, Site location, Traffic/Roads and Occupational Health
- Heritage
- Structural and Design safety
- General environmental protection
- Air Quality, Dust and Fires
- Surface water protection
- Ground water protection
- Water monitoring
- Soil, Fauna and Flora protection
- Wetland and Biota protection
- Rehabilitation

It can be concluded that 89.47% of the conditions sited are auditable. While there are various overlaps between the conditions from various departments, it was not possible to give an exact numerical figure for the overlap of any specific condition that was required, however, it was evident that there are various conditions across the different categories (highlighted throughout the study) that had similar intent in terms of the protection of the environment. Another observation was the fact that the EMPs had more specific requirements / conditions and that the conditions of the authorisation are more general. Some conditions were also duplicated within the same document (albeit worded differently) even though the intent is the same.

From section Plans, Reports, Documentation and Records, above it shows that record keeping, documentation availability during audits, number of plans required for reference over and above the conditions stipulated and the number of reports that are submitted on an annual basis are numerous. The number of reports as listed in Table 4.1 above.

Apart from one post-construction audit for the environmental authorisation, there are nine internal and two external audits annually and a five-yearly audit for the authorisation and EMP. Apart from all the audits, there are numerous communication / informing requirements to the various departments. Interested and affected parties have to be kept informed and all stakeholders involved with FAD 6 must be made aware of the environmental requirements for the facility.

Socio-Economic considerations, competent stakeholders and the establishment of committees are WML and authorisation requirements with socio-economics only addressed by a single condition in the EMP for the WML.

Access Control, Signage, Site location, Traffic / Roads and Occupational Health are predominantly addressed in the two EMPs and it is noted that this is not purely from an environmental protection perspective, but also to ensure occupational safety and security of the area.

Heritage conditions were only noted in the EA and the EMP for the WML. These are however no longer valid as they are only applied to construction phase of the development and therefore all considerations have been finalised.

Structural and design safety conditions form a very important aspect of FADs as improper designs and risks are high in this facility. These aspects are extensively covered in the

licenses and EMPs. The overlap of conditions being specific to bank and slope stability as well as engineering and lining requirements. The EMP for the WML specifies a side slope ration of 1:3 or flatter, a starter wall ratio of 1:2.5, continuous slope rehabilitation every 5m and the side slopes must be terraced when built up by day walls in order to slow down flows that could cause depositional zones on the side slopes. These conditions are a duplication of the WUL conditions. The WML only requires that the slopes are designed to prevent erosion. It can therefore be concluded that these conditions are critical and were therefore important to all the authorities for inclusion.

The general environmental protection conditions include sewage management, waste disposal, bunding for storage and reaction units, hazardous substances (transport and storage), condition of access roads and temporary crossings, construction direction and timing, site location, spillage containment and system operation and maintenance. These conditions are not duplicated in the licenses much but are very prevalent in the EMPs. Most duplication of these conditions centre around spillage containment and waste management. Air quality requirements speak predominantly to dust control and minimization and is duplicated in the EMPs.

While one would expect that the surface water requirements / conditions are addressed predominantly in the WUL, this is not the case. Most of the conditions pertaining to the protection of surface water are found in the EMPs with many conditions being duplicated for storm water management, segregation and run-off, protection of in-stream and riparian habitat and the design requirements for storm water channels. Ground water protection is a high priority of the WUL while seepage and leachate management receive duplicated focus from the EMPs. Water quality and balance are predominantly focused on through the WUL, with very little duplication found in the WML and EMPs. The conditions applying to is downstream water flow and surface and ground water quality monitoring are evident in all licenses and EMPs.

Soil, Fauna and Flora protection relies on the conditions in the EMPs with the focus being on erosion prevention, soil quality and the protection of indigenous species. Fauna protection is duplicated in the two EMPs. It is worth mentioning that the EMP for the GA has 29 conditions related to erosion prevention, most of all categories, and that many of these are duplicated within the EMP.

Wetland and biota protection include consideration for biomonitoring, geohydrology, vibration and also the impact of bridges and road crossings. The two EMPs are very similar with their conditions pertaining to biota and wetland conditions with only a few exceptions.

Rehabilitation conditions are focussed on the rehabilitation of ecological systems, indigenous vegetation, riparian habitat and wetland and biota. As with the protection of wetlands and biota, the EMP for general authorisation mostly focuses on the rehabilitation of indigenous vegetation, ecological systems and visual rehabilitation.

Semi-structured interviews were conducted in order to gauge the general understanding of the consideration for meeting the requirements set out in legislation that allows for co-operative governance and dispensation. Sixteen interview requests were sent, ten persons agreed to the interviews, but only nine interviews were conducted. Two of the ten anticipated participants insisted on answering the questions in writing so that they could have their answers screened prior to submitting, but only one participated and delivered on this commitment. Five interview questions were asked and discussed.

From interview question 1, regarding the governing departments engaged with, or consulted, during the evaluation of applications for licences and authorizations, the study aimed to gauge the various interviewee's understanding of the processes followed during licensing and authorisation and to establish the involvement of the various stakeholders that are required to participate as prescribed by the co-operative governance specified in legislation. From the answers received, one could conclude that most stakeholders had a very good understanding about the process to follow for applications related to licenses and authorisations. There was however a bit of confusion regarding the DWS licensing department's involvement with WML applications. The consultants see the licensing department as an interested party, but the licensing officials indicated that they should have a more active consulting role during this process.

Interview question 2 was asked to test to the various interviewee's understanding of dispensation options that are allowed for in legislation, as well when as when these options are applicable. The question asked about the allowances, if any, are made for dispensation when reviewing applications for licenses and authorizations. Almost all interviewees asked for clarification on the question as dispensation is not a common occurrence. None of the interviewees were involved in dispensation as legislated in section 22(3) of the NWA, but the interviewees dealing with WML / landfill applications, indicated that a WUL is "dispensed" of for these facilities in a positive ROD is received from the DWS.

In establishing how dispensation options, if available, are implemented, question 3 probed the interviewee's personal experiences. From the answers received for question 2 however, it becomes clear that dispensation is not very common. Not only were the interviewees uncertain about the availability of the option, albeit only as listed in Section 22(3) of the Water Act, but only one example of successful dispensation application was available for this, and this not for Sasol or the FADs. The conclusion from this question was that dispensation is left open to interpretation and deduction.

Question 4 evaluates perception between stakeholders and tested interpretation of the processes followed within the various governance departments when considering applications for authorisations, licenses and EMP approvals. This question also helps us understand co-operative governance and its meaning for the various stakeholders around how governing bodies communicate and interact, at the various levels, to ensure the effective issuing of licenses and authorizations. It was interesting to note that there is frustration for the timeframes between governing departments, as much as there is frustration from the specialists and consultants. The process is interdependent and runs in series, so it is time consuming. The interviewees had various opinions about potential improvement of this process for everyone's benefit.

Interview question 5 aimed to address the specific consideration given to ensure that there is no over regulation. This is a complex question as it speaks to the efficiency and effectiveness of environmental governance, and in fact, to the outcome of this study. The answer to this question also proved to be complicated. While each Department has legislations that aims to be efficient in the protection of the environment, they still have internal accountability that restricts their ability to dispense where it is available. This means that all the governing Departments want to ensure that they are covering all basis and that leads to over regulation. The Sasol specialists however had a good understanding regarding the reason for over-regulation and adapted to this way of working in order to preserve their working relationships with the various Departments. It is the opinion of the author that any changes to the current system to prevent over-regulation will have to be driven from the Department.

The study successfully proved that there is over-regulation, but that this is due to varying interpretations of the processes to be followed and because the governing departments work mostly in isolation. While there is inclusion and consultation from DEFF to DWS, there is no need for consultation from DWS to DEFF and this means conditions are duplicated across various licenses.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions

Over-regulation indicates excessive regulation or the imposing of excessive rules and regulations. This research had significance in its aim to establish the extent of over-regulation, if any, through evaluation of the efficiency of environmental governance in the protection of the natural environment. An efficient and robust legislation would ensure equilibrium and balance and if over-regulated, will create opportunity for further research to determine potential mechanisms to alleviate the burden on both the government and industry to become more efficient in the protection of the natural environment. The study found that South Africa has a complex governance structure in terms of environmental protection and is governed through two separate bodies - the DWS govern all water matters on a catchment level and the DEFF governs waste, air, land and biodiversity matters on national, provincial and local level. The evaluation of the various legislation applicable to the SSIC FAD6 facility and further to the review of all the acts and regulations applicable to the governance of the facility showed a robust intent for co-operative governance of environmental resources across the various organs of state. The intent of the governance is depicted in the requirements to consult prior to making decisions that may influence aspects across the various governance structures. It was evident that the options and the implementation within the relevant environmental legislation was to prevent over-regulation while efficiently and effectively protecting the environment but from the documentation review and interviews with the various stakeholders it became clear that the implementation of current governance is not as efficient or effective as it was intended to be. While it is not the intent of the legislature to burden industry to the extent that they cannot sustainably contribute to the economy, there is evidence of definite frustration, from all stakeholders, related to implementation of the law.

The research was expected to show the level of interaction between governing bodies at the various levels in ensuring effective protection of the environment, without over regulation. In other words, it attempted to evaluate the allowances made in legislation to the efficiency and effectiveness of governance in preventing over-regulation. The intent was to show the percentage (%) duplication across the various authorisations and licenses issued to the FAD6 facility at the Sasol Industrial Complex in Secunda. The research concluded that 89.47% of the conditions sited are auditable, but while there were various overlaps between the conditions from various departments, it was not possible to give an exact numerical figure for the overlap of any specific condition that was required because of the difference in the way the conditions and requirements are presented. It was however evident that there are

many conditions across the various categories (highlighted throughout the study) that had similar intent in terms of the protection of the environment.

The study showed that conditions therefore does not always focus on assuring the protection of the environment and on the relevant regulations that should govern the protection of the environment, but rather on details that may cause non-compliance in the event that regulations and requirements change.

Another conclusion was that the EMPs had more specific requirements / conditions and that the conditions of the authorisation are more general. Some conditions were also duplicated within the same document (albeit worded differently) even though the intent is the same.

The study shows a natural tendency by all the authorities to include every aspect to ensure that they do not miss anything in terms of the protection of the environment and this is evident of a superficial attempt at co-operative governance at the most. Over regulation is the result of inadequate communication amongst governance stakeholders, minimal technical understanding in the governing / reviewing structures and staffing limitations that causes insufficient time to understand the business requirements. This all leads to the propensity to over-regulate.

The repetitiveness of conditions across various management plans, authorisation and licenses does not make sense, as any condition or requirement would only need to appear once in the correct license or authorisation to ensure compliance. Further to the duplication there are ad-hoc stand-alone conditions that only appear once in the various licenses, authorisations and management plans.

The results show various overlaps in the conditions for the various authorisations, management plans and licences applicable to the FAD 6 facility and it is safe to say that, although there is no accurate number of the duplication of conditions, that duplication is very evident within the various categories. It is not consistent, and it is understandable that each Department would want to ensure that they have in fact covered the protection of the environment from all aspects. This leads to the conclusion that although there are attempts to minimize over-regulation, that there is not sufficient trust and understanding between Departments to allow them to focus on the aspects relevant to their own expertise only, leading to unavoidable over-regulation.

The study further concluded that one of the main reasons for the over-regulation is in the duplication of the monitoring requirements, plans, reports and records that have to be submitted to the various Departments to prove compliance, and that have to again be considered during audits of authorisations, licenses and EMPs. Business has developed a robust filing system specifically to ensure all requirements are met and invests a lot of time and energy into ensuring that the requirements and conditions are met during audits. This sadly takes the focus away from the protection of the environment and places it on compliance only, which, in the long term will not drive a sustainable attitude towards environmental protection, but rather a focus on crossing the “t’s” and dotting the “i’s”.

The aim of the study was to evaluate the efficiency of environmental governance in the protection of the natural environment, with specific emphasis on the regulations applicable to FAD6. The specific objectives of the study were satisfied as follows:

- It was established that the governance structures in South Africa are complicated by two different bodies. Environmental governance structures in South Africa consists of the Department of Environment, Forestry and Fisheries (DEFF) and Department of Water Affairs (DWS), both forming part of the Economic Services and Infrastructure Development cluster within National Government (National Government of South Africa, n.d.). The DWS is managed according to catchment areas that crosses provincial boundaries, while DEFF is managed on national, provincial and local level. While these departments have robust legislation in terms of co-operative governance, there appears to still be a lot of duplication as a result of how these departments interact to effectively manage and govern in order to protect the natural environment.
- The environmental management plans, authorisations and licenses applicable to the Sasol Secunda FAD 6 facility were unpacked to determine how they relate to the various governing authorities. There are various interactions between governing bodies, but the study showed that while DEFF consults inter-departmentally, they also consulted with the DWS for inputs related to the protection of water resources. The DWS however does not consult with DEFF for inputs related to water matters.
- The study attempted the evaluation of environmental management plans, authorisations and licenses to establish duplication of conditions and requirements related to FAD6 facility at the SIC in Secunda. It was concluded that there is duplication between the conditions from various departments. It was not possible to give an exact numerical figure for the duplication of any specific condition that was required, however, it was evident that there are various conditions across the different categories (highlighted throughout the study) that had similar intent in terms of the protection of the environment. The study further found that the EMPs had more specific requirements / conditions and that the

conditions of the authorisation and licenses are more general. Some conditions were also duplicated within the same document (albeit worded differently) even though the intent is the same.

- Semi-structured interviews were conducted to gauge the general understanding of the consideration for meeting the requirements set out in legislation that allows for co-operative governance and dispensation, the methods used in order to implement such options from regulations, as well as the communication strategies between departments to ensure efficiency of issuing licenses and authorizations. The interviewees showed a good understanding of the requirements set out in legislation, but they all indicated a level of frustration with practical application thereof. A lack of sufficient resources for implementation and governance leads to the propensity to over-, rather than under-regulate. While this does currently suffice to protect the environment, the focus is on policing conditions, rather than implementing systems for the protecting the environment and this is not a sustainable solution.

Various research questions were asked during the proposal phase of the study. These questions were all answered during the study, drawing the following conclusions:

- While governing bodies follows legislative requirements, it appears to be more of a tick-box exercise than a practical approach. There appears to be a resource issue within the various governing departments, making it difficult for any official to work consistently with one client in order to really understand the requirements and practical protection of the environment as intended by law. DEFF does consult with DWS as per the processes depicted in the EIA regulations, but DWS does not consult with DEFF.
- The exact percentage (%) duplication across the various environmental management plans, authorisations and licenses could not be established as the wording for each condition is different, but it was established that there is definite duplication across the various requirements in the categories discussed and within the various authorisations, plans and licenses that were issued to the FAD6 facility at the Sasol Industrial Complex in Secunda.
- From the evaluation of the various legislation applicable to the SSIC FAD6 facility and further to the review of all the acts and regulations applicable to the governance of the facility it is evident that there is a robust intent for co-operative governance of environmental resources across the various organs of state. The extent of this governance is depicted in the requirements to consult prior to making decisions that may influence aspects across the various governance structures. Co-operative governance does not however make provision for dispensation and other than one clause in Section 22(3) of the NWA that encourages dispensation, no other acts or regulations allow for it.

It was evident the options and implementation within relevant environmental legislation, was to prevent over-regulation while efficiently and effectively protecting the environment. This however is not done with great efficiency and therefore leads to over-regulation.

The main aim of this study was to evaluate the efficiency of environmental legislation on fine ash dams in the protection of the environment; a case study in Secunda, Mpumalanga, South Africa. The study showed that there is a definite propensity to over-regulate due to some inefficiencies in the application of environmental legislation.

5.2 Recommendations

This study showed that there is room for more efficient implementation of legislation. The study further highlights the fact that a lot more can be done from different stakeholders to ensure the efficient, effective and sustainable protection of the environment. A few recommendations for further study and potential improvement as follows:

Sasol should investigate the consolidation of all environmental management plans into one EMP for the Sasol Secunda Industrial Complex. This will prevent duplication, more efficient communication between the various stakeholders within the Sasol entity and will embed a reliable and approved plan for managing all impacts on the environment. A single, detailed, consolidated EMP will reduce the work load, resources spending and will allow for embedding a set of conditions that all stakeholders are familiar with.

The main purpose of licenses and authorisations are in ensuring the protection of the environment and on the relevant regulations that should govern the protection of the environment. In order to give assurance to that effect, it is important that the focus of the conditions should be on conditions that give assurance, not details. This will ensure that the legal requirements of the various Acts and Regulations are correctly focussed to ensure the efficient and effective protection of the environment.

Investigate the effect of not duplicating any conditions or requirements and the resultant impact on the protection of the environment – i.e. would a single compliance point be less effective than multiple compliance points related to the same aspect?

The development of a guideline for mutual understanding and alinement as it relates to co-operative governance will go a long way to ensure more efficiency for the evaluation of applications for authorisation and licensing.

A more integrated team, with the correct resource participation, would prevent incidences where a license or authorisation condition needs revisiting at a later stage.

This research could provide a basis for further evaluation for efficient governance around environmental protection without over-regulation by evaluating the application of governance requirements at every phases of an industrial development including construction, operation and closure / rehabilitation phases. For example:

- An authorisation would deal only with construction and commissioning phases and would specify a requirement for licensing and rehabilitation. A post construction audit, obtaining the relevant licenses and adding the equipment to the rehabilitation plan will then close off the authorisation. These conditions would not have to be considered during future audits.
- Licenses will be in effect during operation of any specific unit. This will ensure that legislative changes remain current as licenses are audited and reviewed at more frequent intervals, making sure that all conditions remain aligned with the relevant changes in legislation.

These mechanisms would create opportunity for further research to alleviate the burden on both the government and industry to become more efficient in the protection of the natural environment.

BIBLIOGRAPHY/REFERENCES

Reference documents

ASTM. 1970. *Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter)*, American Standard Test Method. West Conshohocken: ASTM International. (ASTM D1739)

Department of Agriculture, Rural Development, Land and Environmental Affairs. 2016. *Amendment of Environmental Management Programme (EMPr) for the proposed Sasol South Africa (Pty) Ltd Fine Ash Dam 6 (FAD 6) in Secunda, Govan Mbeki Local Municipality: Mpumalanga Province*. 1/3/1/16/5 G-01.

Department of Economic Development, Environment and Tourism. 2012. *Approved Environmental Management Plan in support of Environmental Authorisation for the proposed construction of Fine Ash Dam 6 at Sasol Secunda on the remainder of portion 2 and 3 and on portions 8, 9 and 10 of the Farm Rietvley 320 is within the jurisdiction of Govan Mbeki Local Municipality - Mpumalanga Province*. 17/2/3 GS-6.

Department of Economic Development, Environment and Tourism. 2012. *Environmental Authorisation for the proposed construction of Fine Ash Dam 6 at Sasol Secunda on the the remainder of portion 2 and 3 and on portions 8, 9 and 10 of the Farm Rietvley 320 is within the jurisdiction of Govan Mbeki Local Municipality - Mpumalanga Province.* 17/2/3 GS-6.

Department of Environment, Forestry and Fisheries. 2008. *National Environmental Management: Waste Management Act, No. 59 of 2008*. Cape Town. Government Printer.

Department of Environment, Forestry and Fisheries. 2019. Structure of the department. https://www.environment.gov.za/aboutus/ [25 September 2020].

Department of Environmental Affairs. 2018. *20 Years of Environmental Impact Assessment in South Africa*. https://www.environment.gov.za/sites/default/files/docs/publications/EIAbooklet.pdf [14 September 2020].

Department of Environmental Affairs. 1998. *National Environmental Management Act, No. 107 of 1998*. Cape Town. Government Printer.

Department of Environmental Affairs. 2004. *National Environmental Management: Air Quality Act, No. 39 of 2004*. Cape Town. Government Printer.

Department of Environmental Affairs. 2019. *Waste Management Licence in terms of section 49(1)(a) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) to Sasol South Africa for Category B(2) and (10) for reuse and recycling facility*. 12/9/11/L180410154620/6.

Department of Water and Sanitation. 2016. Water Use License in terms of Chapter 4 of the National Water Act, 1998 (Act No. 36 OF 1998). 01/C12D/CGI/4076.

Department of Water and Sanitation. 2016. *ESTABLISHMENT OF THE VAAL RIVER CATCHMENT MANAGEMENT AGENCY IN TERMS OF SECTION 78(1) OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)*. Government Gazette.

DWS: Gauteng Provincial Operation. 2018. *General Authorisation to Sasol for Registration of*

water use in terms of section 39 of the National Water Act, No 36 of 1998: Sasol South Africa (PTY) Ltd: Power line associated with the Sasol FAD 6. 27/2/2/C42/14/1.

DWS: Vaal Proto Catchment Management Agency. 2016. *General Authorisation to Sasol for Fine Ash Dam (FAD 6) additional infrastructure and powerlines - Risk Assessment for General Authorisation*. 16/2/7/C121/B028.

Durdena, J.M., Murphyc, K., Jaeckeld, A., Van Dovere, C.L., Christiansenf, S., Gjerdeg, K., Ortegah, A., Jonesb, D.O.B. 2017. A procedural framework for robust environmental management of deep-sea mining projects using a conceptual model. Marine Policy, 84:193-201. www.elsevier.com/locate/marpol [21 April 2020].

Feris, L.A. 2010. THE ROLE OF GOOD ENVIRONMENTAL GOVERNANCE IN THE SUSTAINABLE DEVELOPMENT OF SOUTH AFRICA. *Potchefstroom Electronic Law Journal*, 13(1):73-99. http://journals.assaf.org.za/per/index [12 July 2020].

International Organization for Standardization. 2015. ISO 14001:2015(E) Environmental management system – Requirements with guidance for use. Third edition.

Meissner, R., Stuart-Hill, S. and Nakhooda, Z. 2016. The Establishment of Catchment Management Agencies in South Africa with Reference to the *Flussgebietsgemeinschaft Elbe*: Some Practical Considerations. In Karar, E. (eds). *Freshwater Governance for the 21st Century*. Global Issues in Water Policy, vol 6. Springer, Cham: 15-28. https://link.springer.com/chapter/10.1007/978-3-319-43350-9_2 [27 August 2020].

Mofokeng, A.C. 2017. Challenges in developing water management institutions: The case of catchment management agencies (CMAs) in South Africa. Unpublished Magister in Development and Management mini-dissertation, North West University, Potchefstroom campus. https://pdfs.semanticscholar.org/47b5/ae77815412b0dd8d5cad9b348ecb929233b3.pdf [11 August 2020].

Mpumalanga Department of agriculture, rural development, land and environmental affairs. 2016. *Environmental Implementation Plan (2015-2020)*. Provinsiale koerant, Buitengewoon.

Mtolo, K.E. 2010. EFFECTIVENESS OF ENVIRONMENTAL MANAGEMENT FRAMEWORKS IN SOUTH AFRICA: Evaluating stakeholder perceptions and expectations. https://pdfs.semanticscholar.org/c4ba/a018f66af244db492ff47a19068e851728e7.pdf [21 April 2020].

Mungai, E.M., Ndiritu, S.W., Rajwani, T. 2020. Do voluntary environmental management systems improve environmental performance? Evidence from waste management by Kenyan firms. *Journal of Cleaner Production*, Journal Pre-proof. DOI: https://doi.org/10.1016/j.jclepro.2020.121636 [28 April 2020]

National Government of South Africa. N.D. *Department of Water and Sanitation (DWS) Overview*. https://nationalgovernment.co.za/units/view/49/department-of-water-and-sanitation-dws [14 July 2020].

National Government of South Africa. N.D. *Rand Water Overview*. https://nationalgovernment.co.za/units/view/49/department-of-water-and-sanitation-dws [14 July 2020].

National Government of South Africa. N.D. *The National Government Handbook South Africa 2020*. https://nationalgovernment.co.za/ [14 July 2020].

Ntola, Y. and Le Roy, B. 2019. Why South Africa needs an independent water regulator. *Mail and Guardian*: 02 May 2019. https://mg.co.za/article/2019-05-02-00-why-south-africa-needs-an-independent-water-regulator/ [26 August 2020].

Pillay, V. 2016. WATER RESOURCE MANAGEMENT IN SOUTH AFRICA: PERSPECTIVES ON GOVERNANCE FRAMEWORKS IN SUSTAINABLE POLICY DEVELOPMENT. Unpublished Master of Science, University of the Witwatersrand, JoJohannesburg. http://wiredspace.wits.ac.za/jspui/bitstream/10539/22744/1/Vanessa%20Pillay%20Dissertaion%20V1.1_14%2702%272017.pdf [12 August 2020].

Parliament of the Republic of South Africa. N.d. *What Parliament does*. https://www.parliament.gov.za/what-parliament-does# [11 July 2020].

Rand Water. 2018. Annual Report. https://www.randwater.co.za/Annual%20Reports/Forms/AllItems.aspx [14 July 2020].

Rand Water. 2019. Annual Report. https://www.randwater.co.za/Annual%20Reports/Forms/AllItems.aspx [14 July 2020].

Redelinghuis, L. 2016. VAAL RIVER CATCHMENT MANAGEMENT AGENCY. *Shangoni Managment Services Environmental Newsflashes*. http://www.shangoni.co.za/vaal-river-catchment-management-agency/ [11 August 2020].

Republic of South Africa. 1998. *National Water Act, No. 36 of 1998*. Cape Town. Government Printer.

Republic of South Africa. 1999. *National Water Amendment Act, No. 45 of 1999*. Cape Town. Government Printer.

Republic of South Africa. 2005. *National Water Amendment Act, No. 30 of 2004*. Cape Town. Government Printer.

Republic of South Africa. 2005. *Intergovernmental Relations Framework Act, No. 13 of 2005*. Cape Town. Government Printer.

Republic of South Africa. 2014. *National Water Amendment Act, No. 27 of 2014*. Cape Town. Government Printer.

Republic of South Africa. 1997. *National Water Amendment Act, No. 27 of 2014*. Cape Town. Government Printer.

Sasol Limited. 2018. *ENABLING OUR STRATEGY TO DELIVER VALUE SASOL LIMITED Sustainability Report 30 June 2018*. https://www.sasol.com/sustainability/environment/sasols-approach-environmental-management [27 March 2020].

South Africa. 1996. *The Constitution of South Africa*. Pretoria. Government Printer.

South Africa. Department of Environment, Forestry and Fisheries. 2010. *GNR 545 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 2: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D*. Government Gazette.

South Africa. Department of Environmental Affairs. 2010. *GNR 1159 of 10 December 2010:*

National Environmental Management Act, 1998 (Act No 107 of 1998) Amendments to Environmental Impact Assessment Regulations, 2010 and Listing Notices. Government Gazette.

South Africa. Department of Environmental Affairs. 2010. *GNR 544 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Listing Notice 1: List of Activities and Competent Authorities Identified in Terms of Sections (24 (2) and 24D*. Government Gazette.

South Africa. Department of Environmental Affairs. 2010. *GNR 547 of 02 August 2010: National Environmental Management Act, 1998 (Act No 107 of 1998) Environmental Impact Assessment Regulations, 2010: Environmental Management Framework Regulations*. Government Gazette.

South Africa. Department of Environmental Affairs. 2013. *GN 921 of 29 November 2013: National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008), List of waste management activities that have, or are likely to have, a detrimental effect on the environment*. Pretoria. Government Gazette.

South Africa. Department of Water and Sanitation. 2016. *GN 509 of 26 August 2016: General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in section 21(c) or section 21(i)*. Government Gazette.

South African Government. 2012. Minister establishes nine Catchment Management Agencies. https://www.gov.za/minister-establishes-nine-catchment-management-agencies [14 July 2020].

SRK. 2012. Final Environmental Impact Assessment Report and Environmental Management Plan for the proposed Fine Ash Dam 6 (FAD 6) at Sasol Synfuels (Pty) Ltd in the Mpumalanga Province. Report Number 421219/ Final EIA / EMP.

Verheem, R.A.A. and Tonk, J.A.M.N. 2000. Strategic environmental assessment: one concept, multiple forms. *Impact Assessment and Project Appraisal*, 18(3):177-182. DOI: 10.3152/147154600781767411.

WSP. 2019. INDEPENDENT COMPLIANCE AUDITS ON VALID SASOL SECUNDA ENVIRONMENTAL AUTHORISATIONS AND ENVIRONMENTAL MANAGEMENT PLANS CONSOLIDATED REPORT. PROJECT NUMBER: 41101534.

Website references

Department of Water and Sanitation. N.D. WATER USE AUTHORISATION - FREQUENTLY ASKED QUESTIONS. http://www.dwa.gov.za/Documents/BROCHURE_Water%20Use%20Lisence_Outer.pdf [29 July 2020]

National Government of South Africa. 2020. Department of Environment, Forestry and Fisheries (DEFF). https://nationalgovernment.co.za/ [21 June 2020]

National Government of South Africa. 2020. Department of Water Affairs and Sanitation (DWS). https://nationalgovernment.co.za/ [23 October 2019]

National Government of South Africa. 2020. National Departments. https://nationalgovernment.co.za/ [21 June 2020]

APPENDICES

Appendix 1: Interview questionnaire

Appendix 2: Interview concent form

Appendix 3: Ethics approval

Appendix 1: Interview Questionnaire

Cape Peninsula
University of Technology

INTERVIEW QUESTIONNAIRE

Research title: OVER-REGULATION: THE EFFICIENCY OF ENVIRONMENTAL LEGISLATION ON FINE ASH DAMS IN THE PROTECTION OF THE ENVIRONMENT; A CASE STUDY IN SECUNDA, MPUMALANGA, SOUTH AFRICA

Student Name: BRONISLAWA FRANZISKA VAN DER MEER

Student Number: 218086326

INTERVIEWEE DETAILS

Name:	
Company:	
Department:	
Designation / Position:	
Consent form signed:	YES / NO

This interview forms part of the research required to evaluate the efficiency of environmental legislation on fine ash dams in the protection of the environment. The research is conducted in partial fulfilment of the requirements for the Masters degree in Environmental Management (MGEVMC): Environmental and Occupational Studies, presented by the Faculty of Applied Sciences at the Cape Peninsula University of Technology.

This is a semi structured interview, in order to establish:

a. Level of consideration given to meeting the requirements set out in relevant legislation that particularly pertains to dispensation.
b. Methods for implementing dispensation options from regulations.
c. Communication strategies within departments to ensure efficiency of issuing licenses and authorizations.

This questionnaire consists of five primary questions. During the interview, the interviewer will record the interview and will take notes. The interviewer may ask additional questions in order to verify her understanding of the answers provided for clarification purposes.

INTERVIEW QUESTIONS

Question 1: Which governing departments are engaged with, or consulted, during the evaluation of applications for licences and authorizations?

Answer: _____

Question 2: What allowances, if any, are made for dispensation when reviewing applications for licenses and authorizations?

Answer: _____

Question 3: How are dispensation options, if available, implemented?

Answer: _____

Question 4: How does governing bodies communicate and interact, at the various levels, to ensure the effective issuing of licenses and authorizations?

Answer: _____

Question 5: Is any specific consideration given to ensure there is no over regulation?

Answer: _____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Interviewee Signature: _____

Interviewee Name: _____

Date of interview: _____/_____/_____

Interviewer Signature: _____

Appendix 2: Interview Consent Form

Cape Peninsula
University of Technology

INTERVIEW CONSENT FORM

Research title: EFFICIENCY OF ENVIRONMENTAL LEGISLATION TO PROTECT THE ENVIRONMENT ASSOCIATED WITH FINE ASH DAMS IN SECUNDA, MPUMALANGA, SOUTH AFRICA

Student Name: BRONISLAWA FRANZISKA VAN DER MEER

Student Number: 218086326

Interviewee name: _____

This interview forms part of the research required to evaluate the efficiency of environmental legislation on fine ash dams in the protection of the environment. The research is conducted in partial fulfilment of the requirements for the Masters degree in Environmental Management (MGEVMC): Environmental and Occupational Studies, presented by the Faculty of Applied Sciences at the Cape Peninsula University of Technology.

The interview will take approximately one hour. We do not anticipate any risks associated with your participation, but you have the right to stop or withdraw from the interview at any time.

Thank you for agreeing to be interviewed as part of the above-mentioned research project. The Cape Peninsula University of Technology requires that all interviewees give consent to being interviewed and to how the interview information is used. This consent form is therefore designed to make sure that you understand the reason for your participation and to prove that you agree to the conditions of participating in the interview. Please carefully read through the following conditions and sign at the bottom of this consent form if you agree / approve of the following:

- This interview will be recorded, and a transcript will be produced;
- You will be sent the transcript and given the opportunity to correct any factual errors;

_____

Interviewee initial: _____

Date of interview: ____/___/_____

- The transcript of the interview will be analysed by Broni van der Meer (student number 218086326) for inclusion in the above dissertation;
- The interview transcript will be limited to Broni van der Meer, her supervisor and academic colleagues with whom she might collaborate as part of the research process;
- Interview content, summaries and quotations used as part of the academic publication will be anonymous in order to protect the identity of the interviewee;
- The recording of the interview will be deleted after the transcript has been reviewed / verified by the interviewee;
- None of these conditions will be varied without the prior approval of the interviewee.

All or part of the content / information gathered from this interview may be published in academic papers, on our website and in other media that we may produce, such as written or spoken presentations or during feedback sessions.

CONTACT INFORMATION

This research has been reviewed and approved by the Cape Peninsula University of Technology. If you have any additional questions or concerns about this research, please contact:

Broni van der Meer
Student no.: 218086236
E-mail: 218086236@mycput.ac.za
Telephone: 082 619 4610

You can also contact the research supervisor:

Dr Ntokozo Malaza
Faculty of Applied Sciences
Cape Peninsula University of Technology
E-mail: MALAZAN@cput.ac.za
Telephone: 071 497 1688

_____

Interviewee initial: _____

Date of interview: ____/___/_____

By signing this interview consent form, I, the interviewee, agree that:

- My participation in this interview, and therefore this project, is voluntary. I understand that I don't have to take part, and I can stop the interview at any time.
- The transcribed interview or extracts from it may be used as described above.
- I acknowledge that I have read and understand the Information sheet.
- I have no expectation to receive any benefit or payment for my participation in this interview / project.
- On review of the interview transcript I may make edits as I feel necessary to ensure that all the facts are captured correctly.
- I was able to ask questions and I understand that I am free to contact the researcher or her supervisor with any further questions I may have in the future.

Interviewee Signature: _____

Interviewee Name: _____

Date of interview: _____/_____/_____

Interviewer Signature: _____

Appendix 3: Ethics Approval

Cape Peninsula University of Technology

Statement of Permission

Data/Sample collection permission is required for this study.

Reference no.	218086326/06/2020
Surname & name	Van der Meer, B.F.
Student Number	218086326
Degree	Master of Environmental Management
Title	Efficiency of environmental legislation to protect the environment associated with fine ash dams in Secunda, Mpumalanga, South Africa
Supervisor(s)	DR NTOKOZO MFANUFIKILE MALAZA
FRC Signature	
Date	2020 July 07

Cape Peninsula University of Technology

P.O. Box 1906 · Bellville 7535 South Africa ·Tel: +27 21 953 8677 (Bellville), +27 21 460 4213 (Cape Town)

Ethics Approval Letter **Reference no:** 218086326/06/2020

Office of the Chairperson **Research Ethics Committee**	**Faculty of Applied Sciences**

On 29 June 2020, the Faculty Research Ethics Committee of the Faculty of Applied Sciences granted ethics approval to Van der Meer, B.F. for research activities related to a project to be undertaken for a degree (Master of Environmental Management) at the Cape Peninsula University of Technology.

Title of project:	Efficiency of environmental legislation to protect the environment associated with fine ash dams in Secunda, Mpumalanga, South Africa

Comments (Add any further comments deemed necessary, e.g. permission required)

1. Human subjects are involved in the study.
2. This permission is granted for the duration of the study.
3. Research activities are restricted to those detailed in the research proposal.
4. The research team must comply with conditions outlined in AppSci/ASFREC/2015/1.1 v1, CODE OF ETHICS, ETHICAL VALUES AND GUIDELINES FOR RESEARCHERS.

Signed: Chairperson: Faculty Research Ethics Committee	**29/06/2020** **Date**

ANNEXURES

Annexure A	Environmental Authorisation (EA) 17/2/3 GS-6 as Amended, issued by Provincial Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)
Annexure B	Water Use License 01/C12D/CGI/4076, issued by National Department of Water and Sanitation (DWS)
Annexure C	Waste Management License for FAD-6 12/9/11/L45369/6, issued by the National Department of Environmental Affairs (DEA), now the Department of Environment, Forestry and Fisheries (DEFF)
Annexure D	Amended Environmental Management Programme under the Waste Management License
Annexure E	General Authorisation (GA) 509 of 26 August 2016 for additional infrastructure and powerlines, issued by Department of Water and Sanitation (DWS)
Annexure F	New Environmental Management Programme (EMPr) compiled by SRK Consulting dated June 2016, for additional infrastructure and powerlines
Annexure G	Environmental Management Plan (EMP) for General Authorisation (GA) 509 of 26 August 2016 for additional infrastructure and powerlines, issued by Department of Water and Sanitation (DWS)

Annexure A: Environmental Authorisation (EA) 17/2/3 GS-6 as Amended, issued by Provincial Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)

MPUMALANGA PROVINCIAL GOVERNMENT

Building No. 4
No. 7 Government Boulevard
Riverside Park Extension 2
Nelspruit
1200
South Africa

Private Bag X 11215
Nelspruit, 1200
Tel: 013 766 4004
Fax: 013 766 4614
Int: +27 13 766 4004
Int: +27 13 766 4614

Department of Economic Development, Environment and Tourism

Litiko Letekuthuthukiswa Kwetemnotfo, Simondzawo neteku Vakasha | Umnyango WezekuThuthukiswa KoMnotho, iBhodziuko nezamaVakatjho | Departement van Ekonomiese Ontwikkeling, Omgewing en Toerisme

Enquiries : Bheki Mndawe
Telephone : (017) 811 3944
Reference : 17/2/3 GS-6

Christi Brand
Sasol Synfuels Pty Ltd
P.O. Box 1034
Secunda
2302

Fax : (011) 219 3510
Email : christi.brand@sasol.com

Dear Sir

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED CONSTRUCTION OF FINE ASH DAM 6 AT SASOL SECUNDA ON THE REMAINDER OF PORTION 2 AND 3 AND ON PORTIONS 8, 9 AND 10 OF THE FARM RIETVLEY 320 IS WITHIN THE JURISDICTION OF GOVAN MBEKI LOCAL MUNICIPALITY- MPUMALANGA PROVINCE.

With reference to the abovementioned application, please be advised that the Department has decided to grant authorisation. The environmental authorisation and reasons for the decision are attached herewith.

In terms of regulation 10(2) of the Environmental Impact Assessment Regulations, 2010, you are instructed to notify all registered interested and affected parties, in writing and within 12 days of the date of this letter, of the Department's decision in respect of your application as well as the provisions regarding the making of appeals that are provided for in the regulations.

Your attention is drawn to Chapter 7 of the Regulations, which regulates appeal procedures. Should you wish to appeal any aspect of the decision, you must, *inter alia,* lodge a notice of intention to appeal with the MEC, within 20 days of receiving this letter, by means of one of the following methods:

By facsimile: (013) 7668 445
By post: Private Bag x 11215
Nelspruit
1200
By hand: Building 4, Government Boulevard,
Riverside Park Extension 2
Nelspruit
1200

Should you decide to appeal, you must serve a copy of your notice of intention to appeal on all registered interested and affected parties as well as a notice indicating where, and for what period, the appeal submission will be available for inspection.

Yours faithfully

MR. S.S. MALULEKA
CHIEF DIRECTOR: ENVIRONMENTAL SERVICES
DATE: 08.10.2013

cc: Laetitia Coetser SRK Consulting (Pty) Ltd **Fax:** (012) 361 9912 **Email:** lcoetser@srk.co.za

MPUMALANGA PROVINCIAL GOVERNMENT

Building No. 4
No. 7 Government Boulevard
Riverside Park Extension 2
Nelspruit
1200
South Africa

Private Bag X 11215
Nelspruit, 1200
Tel: 013 766 4004
Fax: 013 766 4614
Int: +27 13 766 4004
Int: +27 13 766 4614

Department of Economic Development, Environment and Tourism

Litiko Letekutfutfakiswa Kwetemnotfo, Simondzvo netekuVakasha | Umnyango WezenkuThuthukiswa KoMnotfho, nBhodluluko nezamaVakatjho | Departement van Ekonomiese Ontwikkeling, Omgewing en Toerisme

Environmental Authorisation

Authorisation register number : 17/2/3/GS - 6

Holder of Authorisation : Sasol Synfuels(Pty) Ltd

Location of activity : on various portions of the farm Rietvley 320 IS, within the jurisdiction of Govan Mbeki Local Municipality-Mpumalanga Province.

1. **Decision**
The Department is satisfied on the basis of the information available to it and subject to compliance with the conditions of this environmental authorisation, that the applicant should be authorised to undertake the activity as specified below. Details regarding the basis on which the Department reached this decision are set out in Annexture 1.

2. **Activity authorised**
By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2010, the Department hereby authorises:

Sasol Synfuels Pty Ltd
P.O. Box 1034
Secunda
2302

Contact person: Christi Brand
Fax no: (011) 219 3510
Email: christi.brand@sasol.com

To undertake the following activities (hereafter referred to as "the activities"): The proposed construction of fine ash dam to be known as dam 6 at Sasol Secunda on the remainder of portion 2 and 3 and on portions 8, 9 and 10 of the farm Rietvley 320 IS within the jurisdiction of Govan Mbeki Local Municipality, Mpumalanga Province. The site coordinates are: 26° 5613'S and 29° 1602'E, **Items 9, 10, 11, 12, 18, 22, 28, 37, 55, 56 (R544), 5, 10, 15 and 19 (R545) in terms of Chapter 5 of the National Environmental Management Act, 1998 Government Notice R 544 and R 545 of 18 June 2010 respectively.**

Activity description

The proposed project will entail the following:

- Construction of a residue delivery pipeline system to transport fine ash to the Fine Ash Dam (FAD) 6, and to transport water from the North Dam Return Water Dam (RWD) to the Clear Ash Effluent (CAE) systems and reuse at the processing plant;
- Provision for extra electricity requirements for the ash booster pumps as well as the relocation of existing power lines with the FAD 6 footprint;
- Access bridge over provincial road (R546) for ash lines utilities;
- Return water pipelines
- Settling ponds on the decant outlet;
- Storm water diversion drains;
- Construction of road realignment north of the proposed FAD 6.

The granting of this authorisation is subject to the conditions set out below.

3. **Conditions of authorisation**

Scope of Authorisation

3.1 Authorisation of the activity is subject to the conditions contained in this authorisation, which form part of the environmental authorisation and are binding on the holder of the authorisation.

3.2 The holder of the authorisation shall be responsible for ensuring compliance with the conditions by any person acting on his or her behalf, including but not limited to, an agent, sub-contractor, employee or person rendering a service to the holder of the authorisation.

3.3 The activity which is authorised may only be carried out at the property indicated above.

3.4 Any changes to, or deviations from, the project description set out in this authorisation must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations and it may be necessary for the holder of the authorisation to apply for further authorisation in terms of the regulations.

3.5 A copy of this authorisation must be made available on site at all times and all relevant staff, contractors and sub-contractors must be made familiar with the contents of this authorisation.

3.6 The holder of this authorisation must notify the Department, in writing, within twenty-four (24) hours if any condition of this authorisation is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance.

3.7 These activities must commence within a period of two **(2) years** from the date of issue. If commencement of the activities does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the activities to be undertaken.

3.8 The Department may change or amend any of the conditions in this authorisation if, in the opinion of the Department is environmentally justified

3.9 In the event of any dispute concerning the significance of a particular impact, the opinion of the Department in respect of its significance will prevail.

3.10 This authorisation does not negate the holder of the authorisation, responsibility to comply with any other statutory requirements that may be applicable to the undertaking of the activities.

3.11 The holder of this authorisation is responsible for compliance with the provisions for **Duty of Care and Remediation of Environmental Damage** contained in Section 28 of the National Environmental Management Act, 1998 (Act 107 of 1998).

Appeal of authorisation

3.12 The holder of the authorisation must notify every registered interested and affected party, in writing and within 12 days, of receiving notice of the Department's decision to authorise the activities.

The notification referred to above must:

a) Specify the date on which the authorisation was issued;
b) Inform the interested and affected parties of the appeal procedure provided for in Chapter 7 of the regulations; and
c) Advise the interested and affected parties that a copy of the authorisation and reasons for the decision will be furnished on request.

Management and monitoring of the activities

3.13 The Environmental Management Programme report (EMPr) incorporated in the application for environmental authorisation is hereby approved and must be implemented and adhered to during the construction and operation of the activity.

3.14 The applicant must appoint an independent Environmental Control Officer (ECO) that will have the responsibility of implementing the approved EMPr and ensuring compliance with the conditions of this environmental authorisation.

3.15 The ECO must submit quarterly compliance reports to the Department in writing and copy the applicant with such reports. The reports must include a description of all activities on site, problems identified, transgressions noted and remedial action implemented. All reports must reflect the Department's reference number of the project on the cover page.

3.16 The ECO must maintain the following on site:

(a) A site diary
(b) Copies of all reports submitted to the Department
(c) A complaints' register of all environmental complaints regarding the proposed project and the remedies applied to such complaints

3.17 The holder of the authorization must submit a post-construction environmental audit report to the Department within 30 (thirty) days after completion of the first phase of the construction activities. The audit report must be compiled by an independent auditor.

3.18 The Department retains the right to monitor and/ or inspect the proposed project during both construction and operational phases.

3.19 Dust must be monitored throughout the life cycle of the activity and steps must be taken to ensure that it does not become a health hazard.

Commissioning and operation of the activities.

3.20 Fourteen (14) days written notice must be given to the Department that the activities will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activities will commence.

3.21 The conditions stipulated in this environmental authorisation, mitigation measures and recommendations contained in the final Environmental Impact Assessment Report and Environmental Management Programme report are legally binding components of any contract and are therefore legally enforceable.

3.22 Measures must be taken to prevent and manage soil erosion during and after construction.

3.23 A water use licence must be obtained from the Department of Water Affairs prior to commencement of any activities.

3.24 The pollution of adjacent areas due to improper storage of construction materials as well as other hazardous substances must be prevented.

3.25 Any trenches that are dug during the construction must be back-filled.

3.26 No contaminated water may be discharged to storm water pipes or sewers.

3.27 Mixing of chemicals and hazardous substances must take place on impermeable surfaces.

3.28 Appropriate ablution facilities and waste disposal facilities must be provided during all the phases of the development to prevent pollution of the surrounding environment..

3.29 Any complaints received from the employees or any one within the immediate vicinity of the site during the construction and operational phases of the activity must be attended to as soon as possible and addressed to the satisfaction of all concerned.

3.30 General waste generated during all phases of the activities must be disposed of at a permitted disposal facility.

3.31 The developer must ensure that no faunal species are disturbed, trappec, hunted or killed during the construction phase. Conservation orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non compliance.

3.32 Dust suppression measures on the roads must be implemented to reduce dust levels, these measures include watering of the roads.

3.33 Potential ground water pollution must be prevented

3.34 The lining of the dams must meet the minimum requirements as prescribed by the Department of Water Affairs

3.35 All employees who will be working during the construction of the pipeline must be equipped with emergency procedures in case of any accident.

3.36 Construction personnel must be sensitized to the requirements of the South African Heritage Resources Act. Should any material of cultural or archaeological significance be encountered during construction, all activities must cease immediately and the South African Heritage Resources Agency (SAHRA) must be informed accordingly.

General

3.37 A copy of this authorisation must be kept at the property where the activities will be undertaken. The authorisation must be produced to any authorised official of the Department who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.

3.38 Where any of the applicant's contact details change, including the name of the responsible person, the physical or postal address and/ or telephonic details; the applicant must notify the Department as soon as the new details become known to the applicant.

3.39 The holder of the authorisation must notify the Department, in writing and within 24 (twenty four) hours, if conditions of this authorisation are not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance.

3.40 Non-compliance with a condition of this authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the regulations.

3.41 National government, provincial government, local authorities or committees appointed in terms of the conditions of this authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of authorisation as set out in this document or any other subsequent document emanating from these conditions of authorisation.

ENVIRONMENTAL AUTHORISATION APRROVED BY:

MR. SS MALULEKA
CHIEF DIRECTOR: ENVIRONMENTAL SERVICES
DATE: 08. 10. 2012

ANNEXURE1: REASONS FOR THE DECISION

1. **Background**

The applicant Sasol Synfuels (Pty) Ltd applied for Environmental Authorisation for the following:

The proposed construction of fine ash dam 6 at Sasol Secunda on the remainder of portion 2 and 3 and on portions 8, 9 and 10 of the farm Rietvley 320 IS within the jurisdiction of Govan Mbeki Local Municipality, Mpumalanga Province. The site coordinates are: 26° 5613'S and 29° 1602'E, **Items 9, 10, 11, 12, 18, 22, 28, 37, 55, 56 (R544), 5, 10, 15 and 19 (R545) in terms of Chapter 5 of the National Environmental Management Act, 1998 Government Notice R 544 and R 545 of 18 June 2010 respectively.**

Activity description

The proposed project will entail the following:

- Construction of a residue delivery pipeline system to transport fine ash to the Fine Ash Dam (FAD) 6, and to transport water from the North Dam Return Water Dam (RWD) to the Clear Ash Effluent (CAE) systems and reuse at the processing plant;
- Provision for extra electricity requirements for the ash booster pumps as well as the relocation of existing power lines with the FAD 6 footprint;
- Access bridge over provincial road (R546) for ash lines utilities;
- Return water pipelines
- Settling ponds on the decant outlet;
- Storm water diversion drains;
- Construction of road realignment north of the proposed FAD 6.

2. The applicant appointed the following Environmental Assessment Practitioner to undertake the Environmental Assessment process:

Consultant Name:	SRK Consulting (Pty) Ltd
Address:	P. O. Box 35290 Menlo Park 0102
Contact Person:	Laetitia Coetser
Telephone:	(012) 361 9821
Fax:	(012) 361 9912
Email	lcoetser@srk.co.za

3. **Information considered in making a decision.**

In reaching its decision, the Department took the following into consideration:

a) The information contained in the Environmental Impact Assessment Report (EIAR)
b) The objective and requirements of relevant legislation, policies and guidelines, including Section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

4 Key factors considered in making the decision.

All information presented to the Department was taken into account in the Department's consideration of the application. A summary of the issues that, in the Department's views, were of the most significance is set out below:

a) Need and Desirability of FAD 6
b) The comments received from interested and affected parties as included in the Environmental Impact Assessment Report.
c) Alternatives considered
d) Public Participation
e) Socio-economic impact

5. Findings

After consideration of the information and factors listed above, the Department made the following findings:

a) Fine Ash is produced during the gasification process conducted at Synfuels. Synfuels currently have two FAD's in operation (FAD 4 and FAD 5). FAD 4 is reaching the end of its life span therefore FAD 6 is needed for the company to continue operating.
b) Possible alternatives were considered including the no go alternative, but it is planned that the Synfuels Complex will continue as a primary coal gasification and integrated organic chemicals plant for at least 25 years and will therefore require facilities to store all the waste ash generated by the coal gasification and associated boiler operations.
c) The proposed development will add value to the community and its surroundings by providing temporary employment opportunities during the construction phase.
d) Potential interested and affected parties were given the opportunity to participate in the decision making process by means of newspaper advertisements and site notices, no objections were received.
e) The Department is satisfied that the FAD 6 will have no detrimental impact on the environment provided that the conditions under which this activity is authorised are implemented.

In view of the above, the Department is satisfied that, subject to compliance with the conditions contained in the environmental authorisation, the proposed activity will not conflict with the general objectives of integrated environmental management as laid down in Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and that any potentially detrimental environmental impacts resulting from the proposed activity can be mitigated for to acceptable levels. Authorisation is accordingly granted.

Annexure B: Water Use License 01/C12D/CGI/4076, issued by National Department of Water and Sanitation (DWS)

Ref. No: 27/2/2/C412/4/4
Licence No: 01/C12D/CGI/4076

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Private Bag X313, Pretoria 0001, 185 Francis Baard Street, Sedibeng Building, Pretoria, Tel: 012 336 7500 Fax (012) 323 4472/ (012) 326 2715. www.dws.gov.za

LICENCE IN TERMS OF CHAPTER 4 OF THE NATIONAL WATER ACT, 1998 (ACT NO 36 OF 1998) (THE ACT)

I, **Margaret-Ann Diedricks,** in my capacity as Director General in the Department of Water and Sanitation and acting under authority of the powers delegated to me by the Minister of Water and Sanitation, hereby authorise the following water uses in respect of this licence.

SIGNED: .....

DATE: 13 March 2016

LICENCE NO: 01/C12D/CGI/4076

FILE NO: 27/2/2/C412/4/4

1. Licensee:		**Sasol South Africa (Pty) Ltd: Fine Ash Dam 6**
Postal Address:		Private Bag X1000 SECUNDA 2302
2. Water uses		
2.1	Section 21(c) of the Act:	Impeding or diverting the flow of water in a watercourse, subject to the conditions as set out in Appendices I and II.
2.2	Section 21(g) of the Act:	Disposing of waste in a manner which may detrimentally impact on a water resource, subject to the conditions as set out in Appendices I and III.

B 06328 Director General

2.3	Section 21(i) of the Act:	Altering the bed, banks course or characteristics of a watercourse, subject to the conditions as set out in Appendices I and II.

3. Properties on which the use will be exercised

3.1	Section 21(c) of the Act:	Rem extent of Portion 0,2, Portion 0,1,2,3 & 8 Rietvley 320 IS Rem extent of Portion 10, 20, Portion 10 & 20 Middelbult 284 IS Portion 4 & 6 Twistdraai 285 IS Portion 0 Secunda X35 8488
3.2	Section 21(g) of the Act:	Rem extent of Portion0,2, Portion 0,1,2,3 & 8 Rietvley 320 IS
3.3	Section 21(i) of the Act:	Rem extent of Portion 0,2 Portion 0,1,2,3 & 8 Rietvley 320 IS Rem extent portion 10,20, Portion 10 & 20 Middelbult 284 IS Portion 4 & 6 Twistdraai 285 IS Portion 0 Secunda X35 8488

4. Registered owners of the Properties

4.1 Rem extent of 0, 2, Portion 0, 1, 2, 3 & 8 Rietvley 320 IS – Sasol Synfuels (Pty) Ltd
4.2 Portion 0 Secunda X35 8488 – Sasol Synfuels (Pty) Ltd
4.3 Portion 4 & 6 Twistdraai 285 IS – Sasol Synfuels (Pty) Ltd
4.4 Rem extent portion 10, 20, Portion 10 & 20 Middelbult 284 IS – Sasol Synfuels (Pty) Ltd

5. Licence and Review Period

This licence is valid for a period of thirty (30) years from the date of issuance, and may be reviewed at an interval of not more than five (5) years.

6. Definitions

Any terms, words and expressions as defined in the National Water Act, 1998 (Act 36 of 1998) shall bear the same meaning when used in this licence.

"The Act" means the National Water Act, 1998 (Act 36 of 1998).

"The Department" means the Department of Water and Sanitation.

"The Provincial Head" means the Chief Director: Gauteng Provincial Office Department of Water And Sanitation, Private Bag X995, Pretoria, 0001.

"Extent of the watercourse" means the outer edge of the 1:100 year floodline or the delineated riparian habitat, whichever is the greatest.

"Regulated area of a wetland" is the use of water for section 21 c and i water uses within 500m radius from the boundary of any wetland.

The characteristics of a watercourse/s mean the flow regime, water quality, habitat (including the physical structure of the watercourse/s and associated vegetation) and biota found within the extent of the watercourse/s. The Resource Quality characteristics as defined in the National Water Act, 1998 (Act 36 of 1998).

"Report" refers to the reports entitled

(a) Technical Report and Water Use Licence Application for Sasol Chemical Industries (Pty) Ltd: Fine Ash Dam 6 Project dated August 2014; File 1 and 2, Project 477473 compiled SRK Consulting (South Africa) (Pty) Ltd;
(b) Technical Report and Water Use Licence Application for Sasol Chemical Industries (Pty) Ltd: Fine Ash Dam 6 Project dated August 2014; File 1, Project 477473/IWWMP compiled SRK Consulting (South Africa) (Pty);
(c) Comments and Response Report for the proposed Sasol Synfuels Fine Ash Dam 6 at Secunda within the Mpumalanga Province; Report Number 421219; dated July 2012 compiled by SRK Consulting;
(d) Draft Environmental Impact Assessment Report and Environmental Management Plan for the proposed Fine Ash Dam 6 at Sasol Synfuels (Pty) Ltd in the Mpumalanga Province; Report Number 421219/2 ; dated May 2012 compiled by SRK Consulting.

7. Brief description of the activity

This licence authorises Sasol South Africa (Pty) Ltd: Fine Ash Dam 6 in terms of section 21 (c), (i) and (g) water uses of the National Water Act, 1998 (Act 36 of 1998). The activity involves the construction of Fine Ash Dam 6, West and North Return Water Dam. The dam will be used to store fine ash produced in the gasification and power generation processes at the Sasol Synfuels Industrial Complex. The fine ash is separated from the coarse ash and currently deposited on Fine Ash Dam 5, which is reaching its capacity. The activity is located in Secunda within the Gert Sibande District Municipality of the Mpumalanga Province of South Africa.

APPENDIX I

General Conditions for the Licence

1. The responsibility for complying with the provisions of the licence is vested in the licensee and not any other person or body.

2. This licence is subject to all the provisions contained in the National Water Act.

3. Any contravention of or failure to comply with a condition of the Licence constitutes an offence.

4. The Minister and any person authorised by him/her in writing may at any time enter upon the premises of the Licensee to perform the functions contemplated in section 125 (1), (2) and (3) of the said Act

5. Any person who has timeously lodged a written objection against the application for a license may appeal to the Water Tribunal and the Tribunal may confirm, amend or withdraw the licence or make any other order as it deems appropriate.

6. The licence shall not be construed as exempting the Licensee from compliance with the provisions of any other applicable Act, Ordinance, Regulation or By-law.

7. The Licensee shall immediately inform the Provincial Head of any change of name, address, premises and/or legal status.

8. This licence and any amendment to this licence are subject to all the applicable procedural requirements and other applicable provisions of the Act, as amended from time to time.

9. If the properties mentioned in Clause 3 above are subdivided, sold or consolidated, the owner(s) of the new property (ies) must enter into a written mutual agreement and notify this Department or the Provincial Head within 60 days after the said transaction took place.

10. If a water user association is established in the area to manage the resource, membership of the Licensee to this association is compulsory and rules, regulations and water management stipulations of the association must be adhered to.

11. The Licensee shall be responsible for any water use charges or levies imposed from time to time by a Provincial Head or Department in terms of the Raw Water Pricing Strategy, Waste Discharge Charges, Water Resource Management Charge of the Department, or any other water charge or levies that might be imposed in terms of the appropriate legislation.

12. The Licensee must inform the Department at least 90 days before the expiry date of the licence whether the licence must be considered for another term.

13. The Licensee shall be responsible for appointment of a Responsible Person(s) who will give effect to the various licence conditions and to ensure compliance thereof.

14. The Licensee shall conduct an annual internal audit on compliance with the conditions of this licence. A report on the audit must be submitted to the Provincial Head within one month of the finalisation of the audit.

15. Licensee shall use water efficiently to minimise total water intake, void usage of water where possible, implement "good" housekeeping and operating practices and maximise the reuse/recycle of contaminated water.

APPENDIX II

Section 21 (c) of the Act: Impeding or diverting the flow of water in a watercourse
Section 21 (i) of the Act: Altering the bed, banks, course or characteristics of a watercourse

1. GENERAL

1.1 This licence authorises Sasol South Africa (Pty) Ltd to construct Fine Ash Dam 6 with its associated facilities in close proximity, on and /or within 500m distance of water courses as identified and as set out in Table 1, and in the Water Use Licence Application Reports submitted to the Department or the Responsibility Authority (refer to condition 1.2) for:

Table 1: Water Use Activities

Activity/Facility	Description / Name of watercourse	Dimensions / Diversion Structure/Area	Property Description	Co-ordinates
FAD 6	Unnamed tributary of the Grootspruit	Height: 50.0 m Width: 3500 m Length: 4300 m	Portion 2,3 and 8 of Rietvley 320 IS	**Start** 26°35'58.1"S 29°06'29.2"E **End** 26°38'34.5"S 28°53'28.2"E
West Return Water Dam	Unnamed tributary of Grootspruit	Height: 11.5 m Width: 635 m Length: 578 m	Portion 8 of Rietvley 320 IS	**Start** 26°35'59.0"S 29°06'28.1"E End 26°36'02.0"S 29°06'07.6"E
North Return Water Dam	Unnamed tributary of Kleinspruit	Height: 10 m Width: 317 m Length: 240 m	Remaining Extent of Portion 0 of Rietvley 320 IS	Start 26°35'04.8"S 29°06'56.5"E End 26°34'59.6"S 29°06'54.3"E

Activity/Facility	Description / Name of watercourse	Dimensions / Diversion Structure/Area	Property Description	Co-ordinates
Fence	Crossing unnamed tributary of Grootspruit	Height: 5.3 m Width: 20 m Length: 49.4 m	Portion 8 of Rietvley 320 IS	**Start** 26°36'06.2"S 29°06'03.0"E **End** 26°36'01.8"S 29°06'01.0"E
Pipeline	Unnamed tributary associated with Grootspruit	Height: 4.1 m Width: 2 m Length: 2.447 m	Portion 8 of Rietvley 320 IS	**Start** 26°36'02.0"S 29°06'07.0"E End 26°36'01.0"S 29°06'07.0"E
Pipeline	Unnamed tributary associated with Kleinspruit	Height: 4.1 m Width: 2 m Length: 50.6 m	Remaining Extent of Portion 0 of Rietvley 320 IS	**Start** 26°35'07.5"S 29°06'54.5"E **End** 26°35'06.6"S 29°06'55.5"E
Pump station	Unnamed tributary associated with Grootspruit	Height: 4.1 m Width: 15 m Length: 8.5 m	Portion 8 of Rietvley 320 IS	**Start** 26°36'02.1"S 29°06'06.9"E **End** 26°36'18.7"S 29°08'02.7"E
Penstock Outlet	Unnamed tributary associated with Kleinspruit	Height: 5.5 m Width: 15 m Length: 8.5 m	Remaining Extent of Portion 0 of Rietvley 320 IS;	**Start** 26°35'27.4"S 29°07'04.5"E **End**

Activity/Facility	Description / Name of watercourse	Dimensions / Diversion Structure/Area	Property Description	Co-ordinates
			Portion 3 of Rietvley 320 IS	26°35'18.4"S 29°07'01.3"E
Fence	Unnamed tributary associated with Kleinspruit	Height: 2.4 m Width: 20 m Length: 205 m	Remaining Extent of Portion 0 Rietvley 320 IS	**Start** 26°34'54.0"S 29°06'48.3"E **End** 26°34'48.4"S 29°06'51.7"E
Slurry 1 pipelines crossing	Brandspruit	Height: 4.1 m Width: 7 m Length: 6. 000 m	Remaining Extent of Portion 20 of Middlebult 284 IS	26°34'37.3"S 29°08'18.8"E
Slurry 2 pipelines crossing	Brandspruit	Height: 4.1 m Width: 7 m Length: 6. 000 m	Remaining Extent of Portion 10 of Middlebult 284 IS	26°33'56.2"S 29°08'31.6"E
Slurry 3 pipelines crossing	Groot Bossiespruit	Height: 4.1 m Width: 7 m Length: 6. 000 m	Portion 6 of Twistdraai 285 IS	26°33'58.0"S 29°09'18.0"E
Slurry 4 pipelines crossing	Groot Bossiespruit	Height: 4.1 m Width: 7 m Length: 6. 000 m	Portion 0 of Secunda X35 8488	26°34'02.4"S 29°09'58.1"E
Slurry Wetland, pipelines	Wetland system of Brandspruit	Height: 4.1 m Width: 7 m Length: 6. 000 m	Portion 4 of Twistdraai 285 IS	Start 26°34'28.2"S 29°08'23.7"E End 26°34'10.8"S 29°08'27.1"E

Activity/Facility	Description / Name of watercourse	Dimensions / Diversion Structure/Area	Property Description	Co-ordinates
New and replacement ash slurry pipelines construction within 500m of wetland	Unnamed wetland system	Height: 4.1 m Width: 7 m Length: 6. 000 m	Remaining Extent of Portion 0 of Rietvley 320 IS	26°35'19.8"S 29°07'40.2"E
Pipeline from north RWD to Dam 11 within 500m of a wetland	Hillslope seepage point which forms part of the tributary system of the Kleinspruit	Height: 2 m Width: 2 m Length: 3. 000 m	Remaining Extent of Portion 0 of Rietvley 320 IS	26°35'07.0"S 29°06'55.7"E
Return water canal to the Clear Ash Effluent system within 500m of wetlands	Hillslope seepage point which forms part of the tributary system of the Kleinspruit	Height: 1 m Width: 7.1 m Length: 900 m	Remaining Extent of Portion 0 of Rietvley 320 IS	26°34'42.6"S 29°06'41.9"E
Ash pipeline rack construction within 500m of wetlands	Hillslope seepage point that is associated with the unnamed tributary system of Brandspruit	Height: 4.1 m Width: 7 m Length: 6.000 m	Remaining Extent of Portion 2 of Rietvley 320 IS	26°34'37.3"S 29°08'18.8"E
Bridge construction within 500m of wetlands	Hillslope seepage point that is associated with the unnamed tributary system of Brandspruit	Height: 5 m Width: 13 m Length: 30 m	Remaining Extent of Portion 0 of Rietvley 320 IS	26°35'23.7"S 29°07'44.9"E
Dust suppression of haul road/working area within 500m of	Grootspruit/Wetland	6,664,948 m^2 65700 m^3/a	Portion 3,8 of Rietvley 320 IS	

Activity/Facility	Description / Name of watercourse	Dimensions / Diversion Structure/Area	Property Description	Co-ordinates
wetlands				
Dust suppression(of haul road /working area)within 500m of wetlands	Kleinspruit/Wetland	6,664,948 m^2 65700 m^3/a	Portion 0,3 of Rietvley 320 IS	
Dust suppression of haul road/working area within 500m of wetlands	Brandspruit/Wetland	6,664,948 m^2 65700 m^3/a	Portion 2,3,8 of Rietvley 320 IS	

1.2 The licensee must carry out and complete all the activities listed under condition 1.1 according to the following:

1.2.1. Reports submitted to the Department listed under Section 6;

1.2.2. Conditions of this licence;

1.2.3. Any other written direction issued by the Responsible Authority in relation to this licence.

1.3 The conditions of the authorisation shall be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of this activity and the applicant shall take such measures that are necessary to bind such persons to the conditions of this licence.

1.4 No activities must take place within the 1:100 year flood line or within a horizontal distance of 100 meters from any watercourse, estuary, borehole or well, whichever is the greatest, unless authorised by this licence (as part of the activities described in the report(s) (referred to in condition 1.2) submitted to the Department).

1.5 A copy of the water use licence and reports set out under condition 1.2 must be on site at all times.

1.6 Compensation measures for damage to and or mitigation measures must be recommended if avoidance or minimisation of the impacts of the proposed

development is not possible or if mitigation measures fail to adequately protect the in-stream and riparian habitat.

1.7 The necessary erosion prevention mechanisms shall be employed to ensure the sustainability of all structures.

1.8 Construction activities shall start up-stream and proceed into a down-stream direction, so that the recovery processes can start immediately, without further disturbance from upstream construction works.

1.9 Construction activities must be scheduled to take place during the dry seasons when flows are lowest.

1.10 The natural migration of aquatic biota and upstream movement of fish must not be disturbed.

1.11 The development may not impede natural drainage lines.

1.12 The construction camp shall not be located within the 1:100 year flood line or within 100 meters of any watercourse whatever the greatest.

1.13 Vehicles and other machinery must be serviced well above the 1:100 year flood line or within a horizontal distance of 100 meters from any watercourse or estuary. Oils and other potential pollutants must be disposed off at an appropriate licensed site, with the necessary agreement from the owner of such a site.

1.14 All reagent storage tanks and reaction units must be supplied with a bunded area built to the capacity of the facility and provided with sumps and pumps return the spilled material back into the system.

1.15 The system shall be maintained in a state of good repair and standby pumps must be provided.

1.16 Any hazardous substances must be handled according to the relevant legislation relating to transport, storage and use of the substance.

1.17 Any access roads or temporary crossings should be:

1.17.1 non-erosive, structurally stable and should not induce any flooding or safety hazard;

1.17.2 any damage be repaired immediately to prevent further damage.

2. STORMWATER MANAGEMENT

2.1 Stormwater management practices must be constructed, operated and maintained in a sustainable manner throughout the project and for the water use activities set out in condition 1.1 and must include but not limited to the following:

2.1.1 Increased runoff due to vegetation clearance and/or soil compaction must be managed and steps must be taken to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the watercourse(s);

2.1.2 Stormwater must be diverted from around the FAD 6 and roads and must be managed in such a manner as to disperse runoff and to prevent erosion and the concentration of stormwater flow;

2.1.3 The velocity of stormwater discharges must be attenuated and the banks of the watercourses protected;

2.1.4 Stormwater leaving the licensee's premises must in no way be contaminated by any substances, whether such substances is a solid, liquid, vapour or gas or a combination thereof which is produced, used, stored, dumped or spilled on the premises.

2.2 Where necessary works must be constructed to attenuate the velocity of the stormwater discharge and to protect the banks of the watercourse.

2.3 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the watercourse.

2.4 Clean stormwater drains/canals must be made as natural as possible using rock, rock mattresses, topsoil, vegetation with 1:3 (existing designs of 1:1.5 to be changed and submitted for approval) or a flatter side slopes. Canals must not be concrete lined. Discharge points must be designed as bio-retention wetland ponds in conjunction with wetland specialist or river ecologist and must be in a slow diffused manner over as large area as possible and infiltration to be encouraged.

3. WATER QUALITY

3.1 The licensee shall sample the water quality monthly for the variables (Table 2) at the monitoring points both upstream and downstream of the activities and report to the Provincial Head within thirty (30) days after the results of each sampling event is received:

Table 2: Water Quality parameters relevant for sampling

Variable (units)
Electrical Conductivity (EC)(mS/m)
Suspended Solids (SS) (mg/ℓ)
Nitrate (N) (mg/ℓ)
Ammonia (N) (mg/ℓ)
pH
Alkalinity (mg $CaCO_3$/ ℓ)
Phosphate(mg/ℓ)
Calcium (Ca) (mg/ℓ)
Magnesium (Mg) (mg/ℓ)

Potassium (K) (mg/ℓ)
Sodium (Na) (mg/ℓ)
Chloride (Cl) (mg/ℓ)
Sulphate (SO_4) (mg/ℓ)
Fluoride (F) (mg/ℓ)
Aluminium (Al) (mg/ℓ)
Manganese (Mn) (mg/ℓ)
Zinc (Zn) (mg/ℓ)
NO_3/ NO_2 (as N) (mg/ℓ)
NH_3 (as N) (mg/ℓ)
Faecal Coliforms (counts/100 mℓ)

The variables may be amended on discretion of the Responsible Authority. Only an accredited laboratory to be used for analysis.

3.2 Activities (such as maintenance) that lead to elevated levels of turbidity of any watercourse must be prevented, minimised or otherwise remediated. Activities must be scheduled to take place during the dry seasons when flows are lowest where reasonably possible.

3.3 The licensee shall ensure that the quantity of the water to downstream water users does not decrease because of the existence of activities listed under condition 1.1.

3.4 A qualified person must be appointed to assess the quality of water both upstream and downstream of the activities prior to commencement of construction.

3.5 Environmental monitoring, Auditing plan and programme to be detailed and submitted to Provincial Head for approval. Monitoring must be ongoing. Additional monitoring points must be established in the Waterval River up and downstream and confluence with affected streams.

3.6 Water balance must be updated annually.

3.7 Experienced Environmental Control Officer (wetland/river ecology/landscape architecture) to supervise watercourse works on permanent basis.

3.8 Pollution of and disposal/spillage of any material into the watercourse must be prevented, reduced, or otherwise remediated through proper operation, maintenance and effective protective measures.

4 FLOW

4.1 The licensee must determine flood lines (1:50 and 1:100 year) prior to construction to ensure risks are adequately managed. Flood lines must be clearly indicated on the site plan(s) and drawings along with all wetland boundaries.

4.2 The activities must be conducted in a manner that does not negatively affect catchment yield, hydrology and hydraulics. The licensee must ensure that the overall magnitude and frequency of flow in the watercourse(s) does not

decrease, other than for natural evaporative losses and authorised attenuation volumes.

4.3 Appropriate design and mitigation measures must be developed to minimise impacts on the natural flow regime of the watercourse i.e. through placement of structures/supports and to minimise turbulent flow in the watercourse.

4.4 The FAD 6 may not restrict river flows by reducing the overall river width or obstructing river flow.

5. **RIPARIAN AND INSTREAM HABITAT (VEGETATION AND MORPHOLOGY)**

5.1 Activities (including spill clean-up) must start up-stream and proceed into a down-stream direction, so that the recovery processes can start immediately, without further disturbance from upstream works.

5.2 Operation and storage of equipment must not take place within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest unless authorised in this license.

5.3 All activities within the riparian zone should be restricted as far as possible.

5.4 Soils that have become compacted through the activities of the development must be loosened to an appropriate depth to allow seed germination.

5.5 Alien vegetation must not be allowed to further colonise the area, and all new alien vegetation recruitment must be eradicated or controlled, using standard methods approved by the Department.

5.6 Any material removed from the in stream or riparian habitat, may not be stored within the riparian zone, and may not be stored in such a way that will cause damming of water or wash-away.

5.7 Soils that have become compacted through the activities of the development must be loosened to an appropriate depth to allow seed germination.

5.8 The proposed development must not impede the upstream movement of fish.

5.9 Increased runoff due to vegetation clearance and/or soil compaction must be managed and steps must be taken to ensure that stormwater does not lead to bank instability and excessive levels of silt entering the stream.

5.10 Riparian vegetation, including dead trees, may not be removed from the area. In particular, snags (fallen trees and branches) in the river must be protected (i.e. not collected for firewood or any other purpose).

5.11 All reasonable steps should be made to minimise noise and mechanical vibrations in the vicinity of the river.

6. BIOTA

6.1 The licensee must take all reasonable steps to allow movement of aquatic species, including migratory species.

6.2 Allow faunal movement in wetland areas.

7. REHABILITATION

7.1 All disturbed areas must be re-vegetated with an indigenous seed mix in consultation with an indigenous plant expert, ensuring that during rehabilitation only indigenous shrubs, trees and grasses are used in restoring the biodiversity.

7.2 The vegetation of the surrounding catchment should also be managed to prevent erosion and siltation of the water course.

7.3 The licensee shall take steps necessary to allow movement of aquatic species, including migratory species during the rehabilitation programme.

7.4 The licensee shall embark on a systematic long-term rehabilitation programme to restore natural watercourses to environmentally acceptable and sustainable conditions after construction, which shall include, but not be limited to:

7.4.1 The rehabilitation of disturbed and degraded riparian areas to restore and upgrade the riparian habitat integrity to sustain a bio-diverse riparian ecosystem; and

7.4.2 Annually assess the habitat to monitor the sustainability of the diversions and compliance with these conditions. Action must be taken to rectify any negative impacts.

7.5 The licensee shall ensure that the volume of flow is not reduced except for natural evaporative losses and the authorised attenuation volumes.

7.6 The impacted tributaries up to the confluence of the Waterval River must be rehabilitated into an ecological system and it must be ensured that future mining or disturbance will not further take place around the disturbed watercourses.

7.7 Side slopes of ash dam to be 1:3 or flatter and slopes protected with inter alia rock, topsoil and vegetation and specialist measures as designed.

7.8 Rehabilitation Plan to be submitted to Regional Head for approval and to include a Plant Species Plant by landscape architect, wetland specialist or botanist and wetland rehabilitation mitigation measures.

7.9 Landscape maintenance plan to be submitted to Regional Head for approval within twelve (12) months of issuance of this licence.

7.10 Present Ecological State, Ecological Importance & Sensitivity and Recommended Ecological Management Class (REC) of Waterval River, impacted tributaries and wetlands must be determined and not be lowered.

Wetland specialist and river ecologist must determine what discharges must be made back to the natural system (tributaries, wetlands and Waterval River) and where the discharges must be. Discharge points must be designed in conjunction with river ecologist or wetland specialist.

7.11 Rehabilitation to be concurrent for all impacted areas including side slopes of ash dam and rehabilitation team to include wetland expert.

7.12 Environmental Management Plan, Rehabilitation plan and complaints register to be kept on site.

8. GENERAL SURFACE WATER DESIGN REQUIREMENTS AND CRITERIA

8.1 The licensee shall schedule construction activities at or close to river crossings, streams or wetlands to take place during low flow periods.

8.2 The licensee shall clearly indicate all wetlands boundaries within the project area on layout plans.

8.3 Design and planning of all proposed construction activities adjacent to or in the vicinity of rivers, streams and wetlands shall consider the following measures:

8.3.1 Impact of alignment on springs and wetlands shall be investigated and monitored and ensure their continued functioning,

8.3.2 Where appropriate, large individual indigenous riparian trees shall be avoided during construction and shall be clearly marked on site;

8.3.3 All construction roads in or adjacent to the riparian zone shall be minimised and if required, shall be aligned and managed so as to minimise disturbance of the riparian zone and in-stream habitats;

8.3.4 Designs to be made safe for people and animals.

8.4 Fencing to be of palisade at watercourse crossings (whenever applicable).

8.5 Bridges and road crossings must make provision for ecological connectivity and fish and other aquatic species requirements as determined by river ecologist or wetland expert. Sufficient culverts to cater for life of project and ecological connectivity and floods to be included. Alternatively concrete slabs with rough surfaces to be constructed. Approaches of watercourse crossings must be made permanent. Road side drains must end in energy dissipating structures with rock mattresses and bio retention ponds.

8.6 The licensee shall do bio-monitoring to determine the impact, change, deterioration and improvement of the aquatic system associated with the activities that of impeding, altering or diverting the water resource.

APPENDIX III

Section 21(g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource

1. CONSTRUCTION AND OPERATION

1.1 The licensee shall carry out and complete all the activities, including the construction and operation of the FAD6 with its associated facilities as listed in Table 3, according to Technical Report and Water Use Licence Application for the Sasol Chemical Industries (Pty) Ltd Fine Ash Dam 6 Project, Mpumalanga Province volume 1 and 2 dated August 2014 with reference 477473 compiled by SRK Consulting (South Africa) (Pty) Ltd.

Table 3: Waste and waste water disposal facilities/areas

Activity	Property	Coordinates
Dust Suppression of haul roads/working area	Portion 3 and 8 of Rietvley 320 IS	26°36'07.7"S 29°07'34.2"E
Dust Suppression on haul roads/working area	Portion 2,3,8 of Rietvley 320 IS	26°34'34.8"S 29°08'17.6"E
Dust Suppression on haul roads/working area	Portion 0,3 of Rietvley 320 IS	26°35'27.3"S 29°07'03.2"E
Disposal of ash into FAD 6	Portion 2, 3, 8 of Rietvley 320 IS	26°35'36.4"S 29°06'50.8"E
Containment of waste water from FAD6 and runoff into West Return Water Dam	Portion 8 of Rietvley 320 IS	S 26°35'56.4" E 29°06'08.4"
Containment of waste water from FAD6 and runoff into North Return Water Dam	Remaining Extent Portion 0 of Rietvley 320 IS	S 26°34'53.7" E 29°06'59.9"

1.2 The construction of the FAD6 with its associated infrastructures must be carried out under the supervision of a professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 1990 (Act 114 of 1990), as approved by the designer.

1.3 Within 30 days after the completion of the activities referred here in accordance with the relevant provisions of this licence, the licensee shall in writing, under reference 27/2/2/C412/4/4, inform the Provincial Head thereof. This shall be

accompanied by a signature of approval from the designer referred to above that the construction was done according to the design plans referred to in the Report.

1.4 The licensee must ensure that the disposal of the waste water originating from the FAD 6 and the operation and maintenance of the system are done according to the provisions in the Reports submitted to the Department.

1.5 The FAD 6 shall be operated and maintained to have a minimum freeboard of 0.8 metres above full supply level.

1.6 The licensee shall use acknowledged methods for sampling and the date, time and sampler must be indicated for each sample.

1.7 Flow metering devices shall be maintained in a sound state of repair and calibrated by a competent person at intervals of not more than once in two years. Calibration certificates shall be available for inspection by the Provincial Head or his representative upon request.

2 DISPOSAL OF WASTE AND WATER CONTAINING WASTE

2.1 The Licensee is authorised to dispose of a maximum quantity in cubic metres (m^3) of waste or water containing waste per annum into the waste management facilities/areas as described below in Table 4.

Table 4: Volume of waste and water containing waste to be disposed

Facility/Activity	Volume (m^3/a)	Waste Description	Property
Dust Suppression of haul roads/working area	65 700	Dirty water from coal gasification and integrated petro-chemical industry	Portion 3 and 8 of Rietvley 320 IS
Dust Suppression of haul roads/working area	65 700	Dirty water from coal gasification and integrated petro-chemical industry	Portion 2,3,8 of Rietvley 320 IS
Dust Suppression of haul roads/working area	65 700	Dirty water from coal gasification and integrated petro-chemical industry	Portion 0,3 of Rietvley 320 IS
Disposal of ash into FAD 6	3 319 005	Slurry of fine ash	Portion 2, 3, 8 of Rietvley 320 IS
Containment of waste water	58 400 000	Clear ash effluent	Portion 8 of Rietvley 320 IS

Facility/Activity	Volume (m^3/a)	Waste Description	Property
from FAD6 and runoff into West Return Water Dam			
Containment of waste water from FAD6 and runoff into North Return Water Dam	14 600 000	Clear ash effluent	Remaining Extent Portion 0 of Rietvley 320 IS

2.2 Any groundwater recharge into the FAD 6 should be managed and the water level be monitored and kept to a minimum level to avoid the release of poor quality water into the surface resources and ensure surface streams do not act as secondary sources of contamination during operational, decommissioning and closure phases.

2.3 The Licensee shall submit within a period of twelve (12) months from the date of issuance of this licence to the Provincial Head for approval a concise report in which all possible sources of pollution are identified, the engineered mitigating measures formulated and a programme for the implementation.

3. MONITORING

3.1 A groundwater management plan, in terms of both quantity and quality, needs to be developed and implemented, including monitoring of groundwater up and down gradient of the FAD 6, during operational, decommissioning and closure.

3.2 The groundwater quality must be monitored on a quarterly basis by taking water samples to accredited laboratory for analysis. This will assist to determine as to whether, groundwater resource is contaminated or not.

3.3 The established boreholes details to monitor groundwater around the FAD 6 area to identify the impacts on the groundwater resource should be submitted to the Provincial Head.

3.4 The date, time and monitoring point in respect of each sample taken shall be recorded together with the results of analysis.

3.5 Monitoring points shall not be changed prior to notification to and written approval by the Provincial Head.

3.6 Extra boreholes should be drilled upstream of the site where the activity will be taking place and water samples must be taken from all the monitoring boreholes using approved sampling techniques and adhering to recognised sampling procedures.

4 WATER RESOURCE PROTECTION

4.1 The impacts of FAD 6 and its associated activities on groundwater must not exceed the groundwater quality limits as indicated in Table 5.

Table 5: Groundwater quality limits

Parameters	Limit
pH	5.0 -9.5
Electrical Conductivity (mS/m)	<150
Sodium (mg/l)	<200
Magnesium (mg/l)	<70
Calcium (mg/l)	<150
Chloride (mg/l)	<200
Sulphate (mg/l)	<400
Nitrate (mg/l)	<10
Fluoride (mg/l)	<1.5

4.2 The licensee shall ensure that dirty stormwater is not released into the water resource and must be contained on a dirty water containment facility.

4.3 Emergency action plans in cases of groundwater pollution emanating from the FAD 6 or any storage facilities should be adhered too to protect groundwater quality from degradation, and a plan for remediation must be developed and ensure that the corrective measures implemented are adequate. This action plan should inter alia identify the sources of potential groundwater contamination. The potential impacts should be quantified and their contribution factored into the remedial strategy of groundwater resource.

4.4 Water samples must be taken from all the monitoring boreholes by using approved sampling techniques and adhering to recognized sampling procedures. Samples should be analyzed for both organic as well as inorganic pollutants, as the activity often lead to hydrocarbon spills in the form of diesel and oil. At least the following water quality parameters should be analyzed for:

4.1.1 Major ions (Ca, Mg, Na, SO_4, NO_3, Cl, F);
4.1.2 pH;
4.1.3 Electrical Conductivity (EC);
4.1.4 Total Alkalinity.

4.5 The Licensee must ensure in advance that alternative water supply for external water users is provided to these users should groundwater resources be impacted.

4.6 A proper ground and surface water monitoring network should be established to monitor the quality and quantity of groundwater as per the report recommendation and ensuring that water used by other water users are safeguarded in accordance to chapter 14 of the National Water Act, 1998.

4.7 The FAD 6 and /or its associated infrastructure must be designed in such a manner that any spillage can be contained and reclaimed without any impact on the surrounding environment, a plan must be in place to stop overflowing into water resource in case of rainy seasons.

5 REPORTING

5.1 The Licensee shall submit the results of analysis for the monitoring requirements to the Provincial Head on an annual basis under Reference number 27/2/2/C412/4/4.

5.2 The licensee shall submit the nature and the quality of the waste water disposed into the FAD 6 and /or its associated infrastructure.

6 WATER CONSERVATION AND WATER DEMAND MANAGEMENT

6.1 Licensee shall develop and submit water conservation and demand management (WC/WDM) plan to the Provincial Head, which

6.1.1 quantify the water use efficiency of the activity;

6.1.2 contain the industry water management and water loss strategies and programmes;

6.1.3 sets annual targets for improved water use efficiency for the activities in the industry and waste disposal practices and stipulates which measures will be implemented to achieve the target on the industry;

6.2 Licensee shall update the WC/WDM plan on an annually basis and submit to the Provincial Head for approval.

6.3 Licensee shall report on annual basis the implementation of water conservation and water demand management measures including retrofitting with water efficient technologies and devices, reduction of total water demand, improvement in water use efficiency benchmarks and targets.

(END OF LICENCE)

Annexure C: Waste Management License for FAD-6 12/9/11/L45369/6, issued by the National Department of Environmental Affairs (DEA), now the Department of Environment, Forestry and Fisheries (DEFF)

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001• Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

File Reference. 12/9/11/L45369/6
EDMS Reference: WL147748
Enquiries: Mr Bonginkosi Dlamini
Tel: (012) 399 9778 **Fax:** (012) 359 3625 **Email:** brdlamini@environment.gov.za
www.environment.gov.za

LICENCE NUMBER	:	12/9/11/L45369/6
CLASS	:	CLASS + C: DISPOSAL OF GENERAL WASTE
WASTE MANAGEMENT FACILITY	:	SASOL SECUNDA FINE ASH DAM 6 WASTE DISPOSAL FACILITY
LOCATION	:	PORTION 0,2,3,7,8,9,AND 10 OF THE FARM RIETVLEY 320 IS
LICENCE HOLDER	:	SASOL SOUTH AFRICA (PTY) LTD
ADDRESS	:	PRIVATE BAG 1000, SECUNDA, 2302
CONTACT PERSON	:	MR. SIMON VAN RENSSEN
CONTACT DETAILS	:	TEL: (017) 610 5065 Email:simon.vanrenssen@sasol.com

WASTE MANAGEMENT LICENCE IN TERMS OF SECTION 49(1)(a) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO. 59 OF 2008)

In terms of the National Environmental Management: Waste Act, 2008 (Act No.59 of 2008) read with the, the Environmental Impact assessment Regulations, 2010, published in Government Notice No. 543 of 18 June 2010 (the Regulations), the Deputy Director General: Chemicals and Waste Management, acting under delegation, hereby grants Sasol South Africa (Pty) Ltd a Waste Management Licence for the following waste management activities as listed in Category B of Government Notice No 921 dated 29 November 2013:

Batho pele- putting people first

Category A

(1) The storage of general waste in lagoon.

(13) The Expansion of a waste management activity listed in Category A and B of this Schedule which does not trigger an additional waste management activity listed in Category A or B of this Schedule.

Category B

(8) The disposal of general waste to land covering an area in excess of 200m² and with total capacity exceeding 25 000 tons.

(10) The construction of facilities for activities listed in Category B of this Schedule (not in isolation to associated activity)

In this Licence, "Director" means the Director: Licensing of the National Department of Environmental Affairs who may be contacted at the address below:
Director: Licensing
Department of Environmental Affairs
Private Bag X 447
PRETORIA
0001

In this Licence, "Director: RPW" means the Director: Resource Protection and Waste of the National Department of Water and Sanitation who may be contacted at the address below:
Director: Resource Protection and Waste
Department of Water and Sanitation
Private Bag X 313
PRETORIA
0001

1. SITE DETAILS

1.1 LOCATION

1.1.1 This Licence authorises the construction and operation of a general waste disposal facility (ash dam 6) on Portion 0,2,3,7,8,9,and 10 of the Farm Rietvley 320 IS within the jurisdiction of Gert Sibande District Municipality in Mpumalanga Province (hereafter referred to as" the Site").

1.1.2 The location of the Site must be according to the co-ordinates indicated on the licence application form, which is defined on Annexure V attached herein after.

1.2 DOCUMENTS CONSIDERED

1.2.1 Final Environmental Impact Assessment Report for Sasol South Africa (Pty) Ltd for the proposed disposal of hazardous waste, and Construction, compiled by SRK Consulting dated May 2015 and hereinafter referred to as 'Report';

1.2.2 The Record of Decision issued by the Department of Water and Sanitation, dated 22 July 2015 and

1.2.3 The waste management application form dated 06 January 2015.

LICENCE CONDITIONS

1.3 SITE SECURITY AND ACCESS CONTROL

1.3.1 The Licence Holder must ensure effective access control of the Waste Management Site to prevent unauthorised entry.

1.3.2 Weatherproof, durable and legible signs in at least three official languages applicable in the area must be displayed at each entrance to the site.

1.3.3 The signs must indicate the risks involved in entering the Site, include the name, address and telephone number of the Licence Holder and the person responsible for the operation of the Site.

2. MANAGEMENT

2.1 GENERAL MANAGEMENT

2.1.1 The activities shall be managed and operated:

In accordance with an approved Environmental Management Programme (EMPr), that, *inter alia*, identifies and minimises the risk of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformance as well as those drawn to the attention of the Licence Holder as a result of complaints;

a) In accordance with conditions of this Licence and any other written instruction by the Director; and

b) By an adequate, competent staff complements.

2.1.2 Any persons having duties that are or may be affected by this Licence must have convenient access to a copy thereof, which copy must be kept at or near the place where those duties are carried out.

2.1.3 A copy of this Licence may be published by the Department, in its discretion, on any website or other media.

2.2 DESIGNATION OF WASTE MANAGEMENT CONTROL OFFICER

2.2.1 A Waste Management Control Officer (WMCO) must be designated in writing to monitor and ensure compliance and correct implementation of all mitigation measures and provisions as stipulated in the licence and standard operation procedures. The WMCO must:

(a) Report any non-compliance with any Licence conditions or requirements or provisions of NEM:WA to the licensing authority.

(b) Monitor the construction of the infrastructure to ensure that the layout plans are in accordance to the designs and record important findings of the Site Inspection.

2.2.2 The duties and responsibility of the WMCO should not be seen as exempting the Licence Holder from any other legal obligations in terms of the NEM:WA.

2.3 EMERGENCY PREPAREDNESS PLAN

2.3.1 The Licence Holder must maintain and implement an emergency preparedness plan and review it annually when conducting audit, after each emergency incident and major accident. The plan must, amongst others, include measures to address:

a) Power failure;
b) Equipment malfunction;
c) Site fires;
d) Spillage (on Site);
e) Natural disasters such as floods; and
f) The plan must include contact details of the nearest police station, ambulance services and the emergency centre.

3 PERMISSIBLE WASTE

3.1 Any portion of the Site, which has been constructed or developed according to the Class C barrier designs in accordance with Regulation 636, National Norms and Standards for Disposal of Waste to Landfill, dated 23 August 2013 as approved in writing by the Department of Water and Sanitation Chief Directorate: Engineering services in a letter dated 21 November 2014, may be used for the disposal of waste classified as Type 3 Waste according to Regulation 634, Waste Classification and Management Regulations, dated 23 August 2013.

3.2 The Site or any portion thereof may only be used for the disposal of permissible waste if the Site or any such portion has been constructed or developed according to the conditions listed under condition 4 of this Licence.

4. CONSTRUCTION OF THE ACTIVITY

4.1 Construction and further development within the proposed landfill site shall be carried out under the supervision of a Registered Professional Engineer. Any development on site must adhere to a Class C containment barriers design as described in Regulation 636, National Norms and Standards for Disposal of Waste to Landfill, dated 23 August 2013 including a lined leachate collection dam as approved by the Department of Water and Sanitation Chief Directorate: Engineering Services dated 26 November 2014.

4.2 After construction of the Site or further development within the Site, the Licence Holder shall notify the Director thereof and the Registered Professional Engineer shall submit a certificate or alternatively a letter to the Director that the construction of the Site or further development within the Site, as proposed by the Licence Holder and approved by the Director, is in accordance with recognised civil engineering practice and the requirements in this licence , before disposal may commence on the Site. If the Director is satisfied with the construction of the Site or any further development within the Site and has given written permission, the Licence Holder may use the Site or any further development within the Site for the disposal of waste.

4.3 Works shall be constructed and maintained on a continuous basis by the Licence Holder to divert and drain from the Site in a legal manner, all runoff water arising on land adjacent to the Site, which could be expected as a result of the estimated maximum precipitation during a period of 24 hours with an average frequency of once in fifty years (50) (hereinafter referred to as the "estimated maximum precipitation"). Such works shall, under the said rainfall event, maintain a freeboard of 800mm.

4.4 Works shall be constructed and maintained on a continuous basis by the Licence Holder to divert and drain from the working face of the Site, all runoff water arising on the Site, which could be expected as a result of the estimated maximum precipitation and to prevent such runoff water from coming into contact with leachate from the Site. Such works shall, under the said rainfall event, maintain a freeboard of 800mm and be lined to the satisfaction of the Director, to prevent pollution to groundwater.

4.5 Runoff water referred to in condition 4.4 shall comply with the quality requirements of the General and Special Standard, prescribed in terms of the water Act (Act 54 of 1956) as published in Government Notice 991 of 18 May 1984, or with such quality requirements as may from time to time be determined by the Director and shall be drained from the Site in a legal manner.

4.6 Runoff water referred to in condition 4.4 which does not comply with the quality requirements applicable in terms of condition 4.5 and all sporadic leachate from the Site shall, shall by means of works which shall be constructed and maintained on a continuous basis by the Licence Holder and be lined as approved by the Director, to prevent pollution to groundwater –

4.6.1 Be treated to comply with the aforementioned standard and discharged in a legal manner; and/or

4.6.2 with the written approval of the Director be evaporated in lined dams as approved by the director; and/or,

4.6.3 Be discharged into any convenient sewer if accepted by the authority in control of that sewer.

4.7 The Site shall be constructed in accordance with recognised with civil engineering practice to ensure that it remains stable.

4.8 The slope of the sides of the Site shall be constructed in such a manner that little or no erosion occurs.

4.9 Any development which occurs within the 1:100 year flood line and/ or within 500m from the boundary of a wetland would require a water use licence in terms of section 21 of the National Water Act, 1998.

5. GENERAL IMPACT MANAGEMENT AND OPERATION

5.1 IMPACT MANAGEMENT

5.1.1 Waste which is not permissible on Site must be dealt with according to relevant legislation or the Department's policies and practices.

5.1.2 The Licence Holder must ensure that adequate measures are in place to prevent the occurrence of nuisance conditions or health hazards.

5.1.3 The Licence Holder must ensure that all waste that cannot be managed on site must be sent to waste management facilities licensed to manage / handle such waste.

5.2 OPERATION

5.2.1 The Licence Holder must ensure that the disposal of facility operates within its design parameters at all times.

5.2.3 The licence holder must ensure that they apply dust suppression methods for dust control purposes on the access roads to and around the facility.

5.2.4 The Licence Holder must investigate possible ways of implementation of the waste management hierarchy within six (06) months from the date of this licence with the aim to reduce the percentage of waste disposed in relation to waste generated. Proof and results of such investigation must be submitted to the Director within thirty (30) days after completion of the investigation.

5.2.5 The Licence Holder must take all reasonable steps to ensure that the integrity of the waterproof base and bund walls are routinely monitored and corrective action taken before containment integrity is breached.

6. MONITORING

6.1 MONITORING METHODS AND PARAMETERS

6.1.1 The Licence Holder must carry out all tests required in terms of this Licence in accordance with published laboratory analysis methods or those prescribed by and obtainable from the South African Bureau of Standards (SABS), referred to in the Standards Act, 2008 (Act 08 of 2008).

6.1.2 The Licence Holder may only use another method of analysis if approved by the Department.

6.2 WATER QUALITY MONITORING

6.2.1 A monitoring borehole network allows for monitoring of groundwater in the shallow and deep aquifer and downstream of the site, and be maintained by the Licence Holder so that unobstructed sampling, as required in terms of this Licence, can be undertaken. A numerical ground water modelling and geophysical studies should be carried out to map out the geological structure, and monitoring network must also be finalised. The information must be submitted to Director within 6 months of the date of the Licence.

6.2.2 Monitoring boreholes must be equipped with lockable caps. The Department and the Department of Water and Sanitation reserves the right to take water samples at any time and to analyse these samples or have them analysed.

6.3 DETECTION MONITORING

6.3.1 Groundwater and Surface water quality monitoring must be conducted

(a) For variables listed in Annexure III – quarterly

(b) For variables listed in Annexure IV – annually

Or as in the latest Water Monitoring Protocol approved by the Director.

6.3.2 LINER LEAK AND FAILURE DETECTION MONITORING

6.3.2.1 The leachate detection system must be monitored on daily basis for possible leakages. Should a leak or failure be suspected or detected during monitoring or at any time, it must be regarded as an incident according to condition 9.1 below and be addressed to the satisfaction of the Director.

6.3.2.2 Inspections of liners, where liners are accessible must be performed monthly. Liners must be repaired or replaced when inspection test show deterioration /leachate and these corrective actions shall be performed to the satisfaction of the Director.

6.4 INVESTIGATIVE MONITORING

6.4.1 If, in the opinion of Director, a water quality variable listed under the detection monitoring programme, as referred to in condition 6.3, shows an increasing trend, the Licence Holder shall initiate a monthly monitoring programme.

7. INVESTIGATIONS

7.1 If, in the opinion of the Director, environmental pollution, nuisances or health risks may be occurring or are occurring on the Site, the Licence Holder must initiate an investigation into the cause of the problem or suspected problem.

7.2 If, in the opinion of the Director and/or Director: RPW, water pollution may be occurring or is occurring, the Licence Holder must initiate an investigation into the cause of the problem or suspected problem. Such investigation must include the monitoring of the water quality variables at those monitoring points and at such frequency as may be specified by Director: RPW.

7.3 Should the investigation carried out as per conditions 7.1 and 7.2 above reveal any unacceptable levels of pollution, the Licence Holder must submit mitigation measures to the satisfaction of the Director.

8. RECORDS

8.1 The Licence Holder must keep records and update all the information referred to in Annexure III and IV submit this information to the Director on an annual basis.

8.2 All records required or resulting from activities required by this Licence must:

(a) Be legible;

(b) Be made as soon as reasonably practicable and should form part of the external audit report;

(c) If amended, be amended in such a way that the original and any subsequent amendments remain legible and are easily retrievable; and

(d) Be retained in accordance with documented procedures.

8.3 Records demonstrating compliance with condition 2.1.1 must be maintained for five years.

9. REPORTING

9.1 The Licence Holder must, within 24 hours, notify the Director of the occurrence or detection of any incident on the Site, or incidental to the operation of the site, which has the potential to cause, or has caused pollution of the environment, health risks, nuisance conditions or water pollution.

9.2 The Licence Holder must, within 14 days, or a shorter period of time, if specified by the Director, from the occurrence or detection of any incident referred to in condition 9.1, submit an action plan, which must include a detailed time schedule, and resource allocation, signed off by top management, to the satisfaction of the Director and/or the Director: CM of measures taken to -

a) Correct the impact resulting from the incident;
b) Prevent the incident from causing any further impact; and
c) Prevent a recurrence of a similar incident.
d) Other Reports

9.3 In the event that measures have not been implemented within 21 days of the incident to address impacts caused by the incident referred to in condition 9.1, or measures which have been implemented are inadequate, the Director may implement the necessary measures at the cost and risk of the Licence Holder.

9.4 The Licence Holder must keep an incident and complaints register, which must be attached to the external audit report, as well as the Department and the Department of water and Sanitation for audit purposes.

9.5 The Department must be notified without delay in the case of the following:

a) Any malfunction, breakdown or failure of equipment or techniques, accident or fugitive emission which has caused, is causing or may cause significant pollution;
b) The breach of this Licence; and
c) Any significant adverse environmental and health effects.

9.6 The Department must be notified within 14 days of the following changes:

a) Licence Holder's trading name, registered name or registered office address;

b) Particulars of the licence Holder's ultimate holding company (including details of an ultimate holding where a licence holder has become a subsidiary; and

c) Steps taken with a view to the Licence Holder, or any one of them, going into bankruptcy, entering into arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

9.7 The information required in terms of condition 6 must be reported to the Director in yearly report. The information must also be included into a trend report, which must contain a graphical presentation of all results obtained previously at any specific point, as well as an interpretation and discussion of the results of each monitoring occasion.

9.8 The Licence Holder must submit a written report to the Director regarding any deviation from plans described in this Licence and must obtain written permission from the Director before such deviations may be implemented.

10. AUDITING

10.1 INTERNAL AUDITS

10.1.1 Internal audits must be conducted quarterly by the Licence Holder and on each audit occasion an official report must be compiled by the relevant auditor to report the findings of the audits, which must be made available to the external auditor specified in condition 10.2.1.

10.2 EXTERNAL AUDITS

10.2.1 The Licence Holder must appoint an independent external auditor to audit the site bi-annually and the auditor must compile an audit report documenting the findings of the audit, which must be submitted by the licence holder according to condition10.2.3 below.

10.2.2 The audit report must:

a) Specifically state whether conditions of this licence are adhered to;

b) Include an interpretation of all available data and test results regarding the operation of the site and all its impacts on the environment;

c) Specify target dates for the implementation of the recommendations by the Licence Holder to achieve compliance;

d) Contain recommendations regarding non-compliance or potential non-compliance and must specify target dates for the implementation of the recommendations by the Licence Holder and whether corrective action taken for the previous audit non conformities was adequate; and

e) Show monitoring results graphically and conduct trend analysis.

10.2.3 Each external audit report referred to in condition 10.2.1 above must be submitted to the Director within 30 days from the date on which the external auditor finalised the audit report.

10.3 DEPARTMENTAL AUDITS AND INSPECTIONS

10.3.1 The Director reserves the right to audit and/or inspect the Site at any time and at such a frequency as the Director may decide, or to have the Site audited or inspected

10.3.2 The Licence Holder must make any records or documentation available to the Director upon request, as well as any other information the Director may require.

11 MONITORING COMMITTEE

11.1 The Licence Holder must take all reasonable steps to maintain and ensure the continued functioning of the monitoring committee for the normal operative lifetime of the Facility and for the closure of the Facility, as determined by the Director.

11.2 The Monitoring Committee must formulate a terms of reference and code of conduct, according to the Minimum Requirements and to the satisfaction of the Director, under which the Committee can operate.

11.3 The Monitoring Committee shall be representative of relevant interested and affected persons and may consist of at least the following persons:-

11.3.1 representative(s) of this Department;

11.3.2 representative(s) of the Provincial Department responsible for waste management and environmental functions; and

11.3.3 at least 3 (three) persons/parties, or their representatives elected by the local residents.

11.4 The Monitoring Committee shall meet at least once a year and not later than 30 days after the external audit report specified in condition 11.2.

11.5 The Licence Holder must keep minutes of all meetings of the Monitoring Committee and distribute these minutes to all members of the Monitoring Committee within 30 days after the meeting.

12. LEASING AND ALIENATION OF THE SITE

12.1 Should the Licence Holder want to alienate or lease the Site, he/she must notify the Director in writing of such an intention at least 120 days prior to the said transaction for approval.

12.2 Should the approval be granted, the subsequent Licence Holder shall remain liable for compliance with all licence conditions.

13. TRANSFER OF WASTE MANAGEMENT LICENCE

13.1 Should the Licence Holder want to transfer the Licence, he/she must apply in terms of Section 52 of the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008).

13.2 Any subsequent Licence Holder shall be bound by conditions of the Licence.

14. GENERAL

14.1 The disposal of waste and Construction activity may not commence within twenty (20) days of the date of signature of this Licence.

14.2 Should the Licence Holder be notified by the Minister in writing of a suspension of the Licence pending any appeals decision, you may not commence with the activities licenced by the Minister.

14.3 After the appeal period has expired and no good cause to extend the appeal period has been submitted, the activity may commence provided a notice has been submitted to the Department. The notice must include a date on which it is anticipated that the activity will commence.

14.4 This Licence shall not be transferable unless such transfer is subject to condition 13.1.

14.5 This Licence shall not be construed as exempting the Licence Holder from compliance with the provisions of National and Provincial Legislation and any relevant Ordinance, Regulation, By-law or relevant National Norms and Standards. Transgression of any condition of this Licence could result in the Licence being withdrawn by the Department.

14.6 Non-compliance with a condition of this Licence may result in criminal prosecution or other actions provided for in Section 67 (1) of the National Environmental Management: Waste Act, 2008.

14.7 In terms of section 28 and 30 of the NEMA and section 19 and 20 of the National Water Act No.36 of 1998, any costs incurred to remedy environmental damage must be borne by the person responsible for the damage. It is therefore imperative that the Licence Holder reads through and understands the legislative requirements pertaining to the project. It is the Applicant's responsibility to take reasonable measures which include informing and educating contractors and employees about the environmental risks of their work and training them to operate in an environmentally acceptable manner.

14.8 This Licence is valid for a period of ten (10) years and shall be reviewed every three (03) years from the date of issue or at any time before or after that date. The License Holder must initiate the review within six (06) months prior the due date of the intended review. Based on the results of the review, especially compliance to Licence conditions or recommendations from the audit reports and or changing legislation, the Licence could be amended or withdrawn or the validity thereof extended.

15. APPEAL OF LICENCE

15.1 The Licence Holder must notify every registered interested and affected party, in writing and within twelve (12) days, of receiving the Department's decision.

15.2 The notification referred to in 14.1. must –

15.2.1 Inform the registered interested and affected party of the appeal procedure provided for in National Appeal Regulations GN 993 of December 2014 in terms of National Environmental Management Act, 1998, as amended (see Annexure 1);

15.2.2 Advise the interested and affected party that a copy of a Licence will be furnished on request; and

15.2.3 An appeal against the decision must be lodged in terms of National Appeal Regulations GN 993 of December 2014 in terms of NEMA 1998, as amended, from the date of this license, with: The Minister: Department of Environmental Affairs, Private Bag X 447, PRETORIA, 0001
Tel No.: 086 111 2445, Fax No.: (012) 322 2682.

Mr. Mark Gordon
DEPUTY DIRECTOR GENERAL: CHEMICALS AND WASTE MANAGEMENT
DATE: 29/10/2015

ANNEXURE I

APPEALS PROCEDURE IN TERMS OF THE NATIONAL APPEAL REGULATIONS GN 993 TO BE FOLLOWED BY THE APPLICANT AND INTERESTED AND AFFECTED PARTIES UPON RECEIPT OF NOTIFICATION OF A WASTE MANAGEMENT LICENCE

1. LODGING OF AN APPEAL

1.1 An appellant must submit the appeal submission (the Appeal Questionnaire and Appeal and Response Form) to the appeal administrator, and a copy to the applicant, and registered interested and affected parties within twenty (20) days from:

- the date that the notification of the decision for an application for an environmental authorisation or a waste management licence was sent to the registered interested and affected parties by the applicant;, or
- the date that the notification of the decision was sent to the applicant by the competent authority, issuing authority or licencing authority, in the case of decisions other than those referred to above.

1.2 An appeal submission must be submitted in writing in the form of the appeal questionnaire annexed to this guideline as "Appendix A" and accompanied by:

- a completed Appeal and Response Form setting out the grounds of the appeal,
- supporting documentation that is referred to in the appeal which did not form part of the documentation considered when the original decision was made, and

Appendix A

APPEAL QUESTIONNAIRE

An electronic copy of this questionnaire may be obtained from:

Mr Z Hassam at telephone: 012 399 9356 or e-mail:

AppealsDirectorate@environment.gov.za

Once completed, this document must be forwarded to:

E-mail: AppealsDirectorate@environment.gov.za

Physical Address: Department of Environmental Affairs, 473 Steve Biko Road, Environment House, Arcadia, Pretoria, 0002

Appellant's contact information:

Name: _____

Address: _____

_____

_____

Phone: _____

Cell: _____

Email: _____

Project information:

Project name: _____

Authorisation register number as on environmental authorisation:

_____

Authorisation date as on environmental authorisation:

_____

IMPORTANT! Please note:

- *The decision of the department is reflected in the letter of authorisation or rejection. The conditions of approval are contained in the environmental authorisation document, attached to the authorisation letter.*
- *The appeal must be accompanied by all relevant supporting documents or copies of these that are certified as true by a commissioner of oaths.*
- *The grounds of your appeal and the facts upon which they rest must be set out. You should formulate your objections or concerns as averments and not as questions about the project. Please therefore refrain from material or remarks that do not contribute to the merits of your appeal.*
- *To assist in this regard, the following questions are listed as a guideline only – more space may be used if necessary:*

1. Are you lodging this appeal as an individual or on behalf of a community/organisation?

Individual	Community/ organisation

If on behalf of a community or organisation, please provide proof of mandate to do so.

2. Is your appeal based on factors associated with the process that was followed by the applicant in obtaining authorisation?

Yes	No

Please provide reasons:

3. Is your appeal based on factors associated with environmental impacts not taken into account by the department in refusing or authorising the application?

Yes	No

Please provide reasons:

4. Would you agree to the activity proceeding if your concerns can be addressed by rectifying the process or mitigating or eliminating the impacts of the activity?

Yes	No

Please provide reasons:

5. Are you fundamentally opposed to any development activity on the site?

Yes	No

Please provide reasons:

6. Do you have an objection in principle against the development?

Yes	No

Please provide reasons:

7. Does your appeal contain any new information that was not submitted to the environmental consultant or department prior to the department's consideration of the application?

Yes	No

If the answer above is yes, please explain why it should be considered by the Minister and why it was not made available to the environmental consultant or department during the application process.

_____
_____
_____
_____

8. **DECLARATION:**

I declare that the contents of this submission are to the best of my knowledge the truth and I regard this declaration as binding on my conscience.

_____

APPELLANT
DATE:

ANNEXURE II
INFORMATION WHICH SHALL BE SUBMITTED ON AN ANNUAL BASIS CONDITION 6.1

** = Indicate with an X. Please print legibly.*

NAME OF SITE: _____ DATE OF REPORT: _____(y/m/d)

1. Registered owner(s) of property on which waste management facility is situated:

Name	Telephone	
Postal Address	Fax	
	Postal Code	

2. Operator in control of waste management facility:

Name	Telephone	
Identity number	Tel. After hours	
Educational Qualifications		
Other Relevant competencies:		

3. Indicate the type of waste and approximate quantities of waste disposed during the year:

Type of waste (Specify)	Quantity (m^3 $annum^{-1}$)	Source
TOTAL		

4. Indicate the type of waste and approximate quantities of waste transferred for recycling, treatment and disposal during the year:

Type of waste	Quantity (m^3 $annum^{-1}$)	Stored, bailed, transferred, or disposed
TOTAL		

I, the undersigned, declare that the information stated above below is to my knowledge a true reflection of the status at the_____ Waste Management Facility

Signature: _____

Name: _____

Capacity: _____

Place: _____ Date_____

ANNEXURE III

QUALITY VARIABLES REQUIRED FOR DETECTION MONITORING

Monitor at quarterly intervals for:

Alkalinity (P.Alk)

Ammonia (NH_3-N)
Calcium (Ca)
Fluoride (F)
Magnesium (Mg)
Chromium (Total) (Cr)
Chromium (hexavalent) (Cr^{6+})
Chloride (Cl)
pH
Chemical Oxygen Demand (COD)
Nitrate (as N) (NO_3-N)
Sodium (Na)
Electrical conductivity (EC)
Potassium (K)
Sulphate (SO_4)
Total Dissolved Solids (TDS)

ANNEXURE IV

WATER QUALITY VARIABLES REQUIRED FOR DETECTION AND INVESTIGATION MONITORING

Monitor at annual intervals for:

Alkalinity (P. Alk)
Lead (Pb)
Cadmium (Cd)
Boron (B)
Biological Oxygen Demand (BOD)
Calcium (Ca)
Chemical Oxygen Demand (COD)
Chloride (Cl)
Chromium (Hexavalent-Cr^{6+})
Chromium (Total-Cr)
Cyanide (CN)
Electric Conductivity (EC)
Free Saline Ammonia as N (NH_4-N)
Magnesium (Mg)
Mercury (Hg)
Nitrate as N (NO_3-N)
pH
Phenolic Compounds (Phen)
Potassium (K)
Sodium (Na)
Sulphate (SO_4)
Total Dissolved Solids (TDS)
Total Organic carbon (TOC)
Total Organic halogen (TOX)
Volatile Organic compounds
Fluoride (F)

ANNEXURE V

COORDINATES FOR THE WASTE MANAGEMENT FACILITIES AS PER CONDITION 1.1.2

Number of corners	Latitude	Longitude
A	26° 33' 58"	29° 06' 54"
B	26° 34' 00"	29° 05' 52"
C	26° 34' 22"	29° 05' 50"
D	26° 36' 18"	29° 05' 50"
E	26° 36' 28"	29° 07' 21"
F	26° 37' 06"	29° 07' 21"
G	26° 37' 06"	29° 07' 30"
H	26° 35' 03"	29° 08' 21"
I	26° 34' 53"	29° 08' 55"
J	26° 34' 25"	29° 08' 59"
K	26° 34' 19"	29° 09' 26"
L	26° 33' 59"	29° 09' 24"
M	26° 34' 10"	29° 10' 52"
N	26° 33' 37"	29° 11' 24"
O	26° 32' 44"	29° 11' 30"
P	26° 32' 16"	29° 07' 33"
Q	26° 33' 13"	29° 08' 00"
R	26° 33' 27"	29° 08' 04"
S	26° 34' 16"	29° 08' 18"
T	26° 34' 19"	29° 06' 56"

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001 • Environment House, 473 Steve Biko Road, Pretoria, 0002. Tel: +27 12 399 9000, Fax: +27 86 625 1042

Ref. 12/9/11/L45369/6/V
Enquiries: Mr. Bonginkosi Dlamini
Tel: 012 399 9778 **Fax:** 012 359 3625 **Email:**brdlamini@environment.gov.za
www.environment.gov.za

Sasol South Africa (Pty) Ltd
Private Bag X1000
SECUNDA
2302

EMAIL: simon.vanrenssen@sasol.com
TEL: 017 610 5065

Dear Mr. Van Renssen

WASTE MANAGEMENT LICENCE VARIATION TO THE SASOL SOUTH AFRICA (PTY) LTD FOR THEIR FINE ASH DAM 6 DISPOSAL FACILITY FOR THE AMENDMENT OF WASTE MANAGEMENT LICENCE IN TERMS OF SECTION 54(1)(E) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, (ACT NO. 59 OF 2008)

Your application for a Licence variation, dated 31 July 17 refers,

Please note the reference number for this authorisation is 12/9/11/L45369/6/V. After careful consideration of your application the Department would like to inform you that your Licence has been varied as follows:

In terms of National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA) read with the Environmental Impact Assessment Regulations and Environmental Management ,Framework Regulations, 2014, published in Government Notice No. 982 of 4 December 2014 (the Regulations), the Deputy Director General: Chemicals and Waste Management, hereby grants Sasol South Africa (Pty) Ltd a Waste Management Licence for the following waste management activities as listed in Category A and B of the List of Waste Management Activities that Have, or are Likely to Have

a Detrimental Effect of the Environment published in: GN No.921 of 4 December 2014 718 of 29 November 2013 for Category A and B waste management activities

1. **Condition 1.1.1 has been varied as follows:** This licence authorises construction and operation of a general waste disposal facility (Fine Ash Dam 6 and West Return Water Dam) on portion 0, 2, 3, 7, 8, 9 and 10 of the farm Rietvley 320 IS within the jurisdiction of the Gert Sibande Municipality in Mpumalanga Province (hereinafter referred to as "Site").

2. **Condition 1.2.1 has been varied as follows:** Final Environmental Impact Assessment Report and Environmental Management Programme for the Proposed Fine Ash Dam 6 at Sasol Secunda Industrial Complex in the Mpumalanga Province, compiled by SRK Consulting dated May 2015 and hereinafter to as "Report"

3. **Condition 4.1-** Construction and further development within the proposed landfill site shall be carried out under the supervision of a Registered Professional Engineer. Any development on site must adhere to a class C containment barriers design as described in Regulation 636, National Norms and Standards for disposal of Waste to Landfill, dated 23 August 2013 including a lined leachate collection dam as approved by the Department of Water and Sanitation Chief Directorate: Engineering Services dated 26 November 2014 and amended as approved by the Department of Water and Sanitation: Director General dated 12 April 2017.

4. **Condition 4.3-** Works shall be constructed and maintained on a continuous basis by the Licence Holder to divert and drain from the Site in a legal manner, all runoff water arising on land adjacent to the Site, which could be expected as a result of the estimated maximum precipitation during a period of 24 hours with an average frequency of once in fifty years (50) (hereafter referred to as the estimated maximum precipitation"). Temporary upslope runoff diversion drains, for use during construction, may be designed for a lesser precipitation event, as appropriate for the design life of the drains.

5. **Condition 4.4-** Works shall be constructed and maintained on a continuous basis by the Licence Holder to divert and drain from the working face of the Site, all runoff water arising on the Site, which could be expected as a result of the estimated maximum precipitation and to prevent such runoff water from coming into contact with leachate from the Site.

Such works shall be lined in accordance with the design as approved by the Department of Water and Sanitation Chief Directorate: Engineering Services dated 21 November 2014 to prevent pollution to groundwater. The West Return Water Dam shall , under the said rainfall event, maintain a freeboard of 800mm and be lined in accordance with the design approved by the Department of Water and Sanitation: Director General dated 12 April 2017 to prevent pollution to groundwater.

6. **Condition 4.5-** Runoff water referred to in condition 4.4 must be managed in terms of the requirements of the latest version of the Fine ash dam 6 Water Use Licence or with such quality requirements as may from time to time be determined by the Director and shall be drained from the Site in a legal manner.

7. **Condition 4.6-** Runoff water referred to in condition 4.4 which does not comply with the quality requirements applicable in terms of condition 4.5 and leachate from the Site, shall by means of works which shall be constructed and maintained on a continuous basis by the Licence Holder and be lined in accordance with the designed approved by the Department of water and Sanitation chief directorate: Engineering services daled 21 November 2014 and amended as approved by the Department of Water and Sanitation: Director General dated 12 April 2017.

8. **Condition 4.6.2-** Be evaporated in dams in accordance with the design approved by the Department of Water and Sanitation: Director General dated 12 April 2017, and /or as approved by the Director.

9. **Condition 4.6.4-** Be pumped or gravity drained back into the existing Sasol Secunda Clear Ash Effluent system for re-use in slurrying fine ash for transport to Fine Ash Dam 6.

10. **Condition 4.7-** The Site shall be constructed in accordance with recognized civil engineering practice to ensure that it remains stable.

11. **Condition 5.2.1-** The Licence Holder must ensure that the disposal facility operates within its design parameters at all time.

12. **Condition 5.2.2-** The Licence Holder must ensure that they apply dust suppression methods for dust control purposes on the access roads to and around the facility and over the other areas that are authorized for dust suppression.

13. **Condition 5.2.3-** The Licence Holder must investigate possible ways to implementation of the waste management hierarchy within six (06) months from the date of this licence with the aim to reduce the percentage of waste generated. Proof and results of such investigation must be submitted to the Director within thirty (30) days after completon of the investigation.

14. **Condition 5.2.4- Removed**

15. **Condition 6.3.1-** Groundwater and surface water quality monitoring must be conducted in accordance with the Fine Ash Dam 6 Water Use Licence or latest water monitoring protocol approved by the Director.

16. **Condition 6.3.2.1-** The leakage detection system below the liner system must be monitored on a daily basis for possible leakages. Should a leak or failure be suspected or detected during or at any time, it must be regarded as an incident according to condition 9.1 below and be addressed to the satisfaction of the Director. **Amendment not granted.**

17. **Condition 6.3.2.2-** Inspection of liners, where liners are accessible and visible must be performed monthly during the construction phase. Liners must be repaired or replaced when inspection tests show deterioration/leakage and these corrective actions shall be performed to the satisfaction of the Director.

18. **Condition 7.3-** Should the investigation carried out as per conditions 7.1 and 7.2 above reveal any unacceptable levels of pollution, the Licence Holder must submit and implement mitigation measures to the satisfaction of the Director.

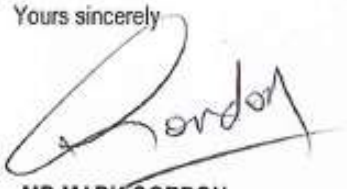
19. **Condition 10.2.1-** The Licence Holder must appoint an independent external auditor to audit the site bi-annually and the auditor must compile an audit report documenting the findings of the audit, which must be submitted by the licence holder according to condition 10.2.3 below. **Amendment not granted**

20. **Condition 15.2-** The notification referred to in 15.1 must-

21. **Annexure V-** coordinates for the Waste Management facilities as per condition 1.1.2

All other contents of the licence are still applicable and must be fully complied with.

Yours sincerely



MR MARK GORDON
DEPUTY DIRECTOR-GENERAL: CHEMICALS AND WASTE MANAGEMENT
DATE: 16/04/2018

Annexure D: Amended Environmental Management Programme under the Waste Management License

agriculture, rural development,
land & environmental affairs
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

Building No. 6, No. 7 Government Boulevard, Riverside Park, 1200, Mpumalanga Province
Private Bag X 11219, 1200
Tel: +27 (013) 766 6067/8, Fax: +27 (013) 766 8295, Int Tel: +27 (13) 766 6067/8, Int Fax: +27 (13) 766 8295

Litiko Letekulima, Kutfutfukiswa Kwetindzawo Tasemakhaya, Temhlaba Netesimondzawo

Departement van Landbou, Landelike Ontwikkeling, Grond en Dngewing Sake

umNyango weZelimo UkuT hutfukiswa kwecNdawo zemaKhaya.

Enquires : Ms. Sindisiwe Mbuyane
Telephone : (017) 811 4830
Reference : 1/3/1/16/5 G-01
NEAS No. : MPP/EIA/AMEND/0000004/2015

Simon van Renssen
Sasol South Africa (Pty) Ltd
P.O. Box 1034
Secunda
2302

Fax : (011) 522 9777
Email : simon.vanressen@sasol.com

Dear Sir,

AMENDMENT OF AN ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE PROPOSED SASOL SOUTH AFRICA (PTY) LTD FINE ASH DAM 6 (FAD 6) IN SECUNDA, GOVAN MBEKI LOCAL MUNICIPALITY: MPUMALANGA PROVINCE.

Your application on the above matter refers:

1. The Department has, in terms of the powers vested in it by regulation 33 of the Environmental Impact Assessment Regulations, 2014, decided to amend the Environmental Authorisation. The amendment entails the following:

   - Change in name from Sasol Synfuels (Pty) Ltd to Sasol South Africa (Pty) Ltd.
   - Change in terminology that has been incorporated in the Amendment issued and signed by the Department on 17 February 2015.
   - Additional monitoring requirements to monitor potential impacts associated with Fine Ash Dam 6.
   - Change of the responsibilities assigned to different positions in the business units of Sasol that were approved in the EMPr that was signed in October 2012.
   - The responsibilities of contractors and sub-contractors.
   - The duties assigned to different members of the Project Management Team.

2. **Reasons considered in granting an amendment**

   a) The change of name had taken effect from the 04th of November 2014 and a certificate was issued.

MPUMALANGA
THE PLACE OF THE RISING SUN

b) The change in terminology does not affect the impacts assessed on the proposed site.

c) The impacts related to the site were addressed and do not change the scope of the proposed amendments.

d) The amendments will not change the scope of the Environmental Authorisation and will not result in any additional impacts.

3. The Department does not deem the amendments to be substantive and to result in significant environmental impacts that would conflict with the general objectives of integrated environmental management as laid down in Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

4. You are instructed in terms of regulation 4(2)of the Regulations to notify all registered interested and affected parties, in writing and within 14 days of the date of this letter, of the Department's decision to amend the Environmental Authorisation as well as the provisions regarding the making of appeals that are provided for in the regulations.

5. Your attention is drawn to Chapter 8 of the Regulations which regulates appeal procedures. Appeals may be lodged by means of one of the following methods:

By facsimile: (013) 766 6067/8

By post: Private Bag x 11219
Nelspruit
1200

By hand: Building 6, No 7 Government Boulevard,
Riverside Park
Nelspruit
1200

Yours sincerely

Mr. S.S. Maluleka
Chief Director: Environmental Affairs
Date: 28·08·15

cc: Dr. Laetitia Coetser
SRK Consulting (Pty) Ltd
lcoetser@SRK.co.za

MPUMALANGA
THE PLACE OF THE RISING SUN

Annexure E: General Authorisation (GA) 509 of 26 August 2016 for additional infrastructure and powerlines and powerlines issued by Department of Water and Sanitation (DWS)

DEPARTMENT OF WATER AND SANITATION
NOTICE 509 OF 2016

GENERAL AUTHORISATION IN TERMS OF SECTION 39 OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998) FOR WATER USES AS DEFINED IN SECTION 21(C) OR SECTION 21(I)

I, Anil Singh, in my capacity as the acting Director-General of the Department of Water and Sanitation, and duly authorized, do hereby issue a Notice to all persons or any category of persons to use water in terms of section 39(1) of the National Water Act, read with section 21(c) or section 21(i).

Mr Anil Singh
DIRECTOR-GENERAL (Acting)
DATE: 27/7/16

SCHEDULE

IMPEDING OR DIVERTING THE FLOW OF WATER IN A WATERCOURSE (SECTION 21(C)), OR ALTERING THE BED, BANKS, COURSE OR CHARACTERISTICS OF A WATERCOURSE (SECTION 21(I)) OF THE NATIONAL WATER ACT (ACT NO. 36 OF 1998).

Purpose of Authorisation

1. This General Authorisation replaces the need for a water user to apply for a licence in terms of the National Water Act (Act 38 of 1998) ("the Act") provided that the water use is within the limits and conditions of this General Authorisation.

Definitions

2. In this Notice any word or expression to which a meaning has been assigned in the Act shall have the meaning so assigned, with specific emphasis on the definitions for **'aquifer', 'borehole', 'estuary', 'instream habitat', 'person', 'pollution', 'resource quality', 'responsible authority', 'riparian habitat', 'waste', 'watercourse', 'water resource'**, and **'wetland'**, unless the context indicates otherwise.

"characteristics of a watercourse" means the resource quality of a watercourse within the extent of a watercourse;

"construction" means any works undertaken to initiate or establish impeding or diverting or modifying resource quality, for the first time, including vegetation removal, site preparation and ground leveling;

"department" means the Department of Water and Sanitation (DWS);

"delineation of a wetland and riparian habitat" means delineation of wetlands and riparian habitat according to the methodology as contained in the Department of Water Affairs and Forestry, 2005 publication: A Practical Field Procedure for Delineation of Wetlands and Riparian Areas;

"diverting" means to, in any manner, cause the instream flow of water to be rerouted temporarily or permanently;

"emergency incident" means an unexpected sudden occurrence leading to a potential or serious danger to the public;

"emergency situation" means any emergency that developed that require immediate intervention for continuation of existing essential service delivery;

"extent of a watercourse" means:

(a) The outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam; and

(b) Wetlands and pans: the delineated boundary (outer temporary zone) of any wetland or pan.

3

"flow-altering" means to, in any manner, alter the instream flow route, speed or quantity of water temporarily or permanently;

"impeding" means to, in any manner, hinder or obstruct the instream flow of water temporarily or permanently, but excludes the damming of flow so as to cause storage of water;

"maintenance" means any works undertaken to repair or partially replace or clean an existing structure so as to keep it in working order and so as to prevent it from having detrimental impacts on a watercourse, which works may result in the short-term (less than 30 days) disturbance or impeding or diverting or alteration of the flow of water in a watercourse; but will not result in changes to the design or size of the structure that will alter the function of the structure, and/or the hydrological functionality or integrity of the watercourse;

"pans" means any depression collecting water or that is inward draining or a flow through system with flow contributions from surface water, groundwater or interflow or combinations thereof;

"regulated area of a watercourse" for section 21(c) or (i) of the Act water uses in terms of this Notice means:

(a) The outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;

(b) In the absence of a determined 1 in 100 year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (*subject to compliance to section 144 of the Act*); or

(c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

4

"rehabilitation" means the process of reinstating natural ecological driving forces within part or the whole of a degraded watercourse to recover former or desired ecosystem structure, function, biotic composition and associated ecosystem services;

"reportable incident" means any incident, including leakages or spillages, at or near any existing structure, or that occurs during works performed at any structure, that has the potential to have a detrimental effect on surface- and/or groundwater resources, including potentially harmful effects to humans, any aquatic biota, or the resource quality, or that can cause potential damage to property, as well as any incident that can lead to or cause any contravention of any of the provisions of this Notice.

"resource quality" means the resource quality as contemplated in section 1 of the Act;

"responsible authority" means the responsible authority as contemplated in section 1 of the Act;

"river management plan" means any river management plan developed for the purposes of river or storm water management in any municipal/metropolitan area or described river section, river reach, entire river or sub quaternary catchment that considers the river in a catchment context and as approved by the Department;

"the Act" means the National Water Act, 1998 (Act No. 36 of 1998);

"water user" means any person who intends to use water in terms of section 21(c) or (i) of the Act and has the responsibility to comply with the provisions of this General Authorisation.

5

Exclusion from this General Authorisation

3. This General Authorisation does not apply—

(a) to the use of water in terms of section 21(c) or (i) of the Act for the rehabilitation of a wetland as contemplated in General Authorisation 1198 published in Government Gazette 32805 dated 18 December 2009,

(b) to the use of water in terms of section 21(c) or (i) of the Act within the regulated area of a watercourse where the Risk Class is Medium or High as determined by the Risk Matrix (**Appendix A**). This Risk Matrix must be completed by a suitably qualified SACNASP professional member;

(c) in instances where an application must be made for a water use license for the authorisation of any other water use as defined in section 21 of the Act that may be associated with a new activity;

(d) where storage of water results from the impeding or diverting of flow or altering the bed, banks, course or characteristics of a watercourse; and

(e) to any water use in terms of section 21(c) or (i) of the Act associated with construction, installation or maintenance of any sewerage pipelines, pipelines carrying hazardous materials and to raw water and wastewater treatment works.

Duration of General Authorisation

4. This General Authorisation is valid from the date of publication and remains effective for a period of 20 (twenty) years unless—

(a) it is replaced or amended by another general authorisation; or

(b) the period is extended for a further period by General Authorisation in the Gazette.

Area of applicability of General Authorisation

5. This General Authorisation applies throughout the Republic of South Africa to the use of water in terms of section 21(c) or (i) of the Act within the regulated area of a watercourse as defined in this General Authorisation.

Exercising water use activities in terms of section 21(c) or (i) of the Act

6. (1) A person who –

(a) owns or lawfully occupies property registered in the Deeds office as at the date of this General Authorisation;

(b) lawfully occupies or uses land that is not registered or surveyed; or

(c) lawfully has access to land on which the use of water takes place;

may, on that property or land –

(i) exercise the water use activities in terms of section 21(c) or (i) of the Act as set out in **Appendix D1** subject to the conditions of this authorisation;

(ii) use water in terms of section 21(c) or (i) of the Act if it has a low risk class as determined through low risk class as determined through the Risk Matrix (**Appendix A**);

(iii) do maintenance work associated with their existing lawful water use in terms section 21(c) or (i) of the Act that has a LOW risk class as determined through the Risk Matrix (**Appendix A**);

(iv) conduct river and storm water management activities as contained in a river management plan (**Appendix B**);

(v) conduct rehabilitation of wetlands (read together with Notice 1198 published in Government Gazette 32805 dated 18 December 2009) or rivers where such rehabilitation activities has a LOW risk class as determined through the Risk Matrix (**Appendix A**); or

7

(vi) conduct emergency work arising from an emergency situation or incident associated with the persons' existing lawful water use, provided that all work is executed and reported in the manner prescribed in the Emergency Protocol (**Appendix C**).

(2)All State Owned Companies (SOC's), and other institutions specified in **Appendix D2** having lawful access to that property or land may on that property use water in terms of section 21(c) or (i) of the Act as specified under each of the relevant SOC's and other institution (**Appendix D2**).

(3) Any water user who used water in terms of Government Notice 1199 published in Government Gazette 32805 dated 18 December 2009 may, subject to the provisions of this General Authorisation, continue with such water use subject to the conditions of this General Authorisation.

Assessment of risk and mitigation factors

7. It is required that the following documents and associated spread sheets be used during the assessment of risk and mitigation of risks:

(a) A Practical Field Procedure for Delineation of Wetlands and Riparian Area (2005) which is available on the Department's website http://www.dws.gov.za, under water use authorization in terms of section 21 (c) or (i) of the Act;

(b) **Appendix A** (Excel Spreadsheet) and information regarding the method used in **Appendix A** is contained in the Department of Water and Sanitation 2015 publication: Section 21(c) and (i) water use Risk Assessment Protocol, which is available on the Department's website http://www.dws.gov.za, under section 21(c) and (i) water use authorization.

(c) Guideline: Assessment of activities/developments affecting wetlands, which is available on the Department's website http://www.dws.gov.za, under section 21 (c) and (i) water

8

use authorization.

(d) Guideline for the determination of buffer zones for rivers, wetlands and estuaries, which is available on the Department's website http://www.dws.gov.za, under water use authorization in terms of section 21 (c) and (i) of the Act.

Assistance to people with special needs

8. The necessary assistance will be given to people with:

(a) Illiteracy;

(b) a disability; or

(c) any other disadvantage including historically disadvantaged individuals;

who cannot, but desire, to comply with this General Authorisation.

Conditions for impeding or diverting the flow of water or altering the bed, banks, course or characteristics of a watercourse

9. (1) The water user must ensure that:

(a) impeding or diverting the flow or altering the bed, banks, course or characteristics of a watercourse do not detrimentally affect other water users, property, health and safety of the general public, or the resource quality;

(b) the existing hydraulic, hydrologic, geomorphic and ecological functions of the watercourse in the vicinity of the structure is maintained or improved upon;

(c) a full financial provision for the implementation of the management measures prescribed in this General Authorisation, including an annual financial provision for any future maintenance, monitoring, rehabilitation, or restoration works, as may be applicable; and

(d) upon written request of the responsible authority, they implement any additional management measures or monitoring programmes that may be reasonably necessary to determine potential impacts on the water resource or management measures to address such impacts.

(2) Prior to the carrying out of any works, the water user must ensure that all persons entering on-site, including contractors and casual labourers, are made fully aware of the conditions and related management measures specified in this General Authorisation.

(3) The water user must ensure that –

(a) any construction camp, storage, washing and maintenance of equipment, storage of construction materials, or chemicals, as well as any sanitation and waste management facilities -

(i) is located outside the 1 in 100 year flood line or riparian habitat of a river, spring, lake, dam or outside any drainage feeding any wetland or pan, and

(ii) is removed within 30 days after the completion of any works.

(b) The water user must ensure that the selection of a site for establishing any impeding or diverting the flow or altering the bed, banks, course or characteristics of a watercourse works:

(i) is not located on a bend in the watercourse;

(ii) avoid high gradient areas, unstable slopes, actively eroding banks, interflow zones, springs, and seeps;

(iii) avoid or minimise realignment of the course of the watercourse;

(iv) minimise the footprint of the alteration, as well as the construction footprint so as to minimise the effect on the watercourse.

(c) The water user must ensure that a maximum impact footprint around the works is established, clearly demarcated, that no vegetation is cleared or damaged beyond this

demarcation, and that equipment and machinery is only operated within the delineated impact footprint.

(d) The water user must ensure that measures are implemented to minimise the duration of disturbance and the footprint of the disturbance of the beds and banks of the watercourse.

(e) The water user must ensure that measures are implemented to prevent the transfer of biota to a site, which biota is not indigenous to the environment at that site.

(f) The water user must ensure that all works, including emergency alterations or the rectification of incidents, start upstream and proceed in a downstream direction, to ensure minimal impact on the water resource.

(g) The water user must ensure that all material excavated from the bed or banks of the watercourse are stored at a clearly demarcated location until the works have been completed, upon which the excavated material must be backfilled to the locations from where it was taken (i.e. material taken from the bed must be returned to the bed, and material taken from the banks must be returned to the banks).

(h) The water user must ensure that adequate erosion control measures are implemented at and near all alterations, including at existing structures or activities with particular attention to erosion control at steep slopes and drainage lines.

(i) The water user must ensure that alterations or hardened surfaces associated with such structures or works –

(i) are structurally stable;

(ii) do not induce sedimentation, erosion or flooding;

(iii) do not cause a detrimental change in the quantity, velocity, pattern, timing, water level and assurance of flow in a watercourse;

(iv) do not cause a detrimental change in the quality of water in the watercourse;

(v) do not cause a detrimental change in the stability or geomorphological structure of the watercourse; and

11

(vi) does not create nuisance condition, or health or safety hazards.

(j) The water user must ensure that measures are implemented at alterations, including at existing structures or activities, to –

(i) prevent detrimental changes to the breeding, nesting or feeding patterns of aquatic biota, including migratory species;

(ii) allow for the free up and downstream movement of aquatic biota, including migratory species; and

(iii) prevent a decline in the composition and diversity of the indigenous and endemic aquatic biota.

(k) The water user must ensure that no substance or material that can potentially cause pollution of the water resource is being used in works, including for emergency alterations or the rectification of reportable incidents.

(l) The water user must ensure that measures are taken to prevent increased turbidity, sedimentation and detrimental chemical changes to the composition of the water resource as a result of carrying out the works, including for emergency alterations or the rectification of reportable incidents.

(m) The water user must ensure that in-stream water quality is measured on a weekly basis during construction, including for emergency alterations or the rectification of reportable incidents, which measurement must be by taking samples, and by analysing the samples for pH, EC/TDS, TSS/Turbidity, and/or Dissolved Oxygen ("DO") both upstream and downstream from the works.

(n) The water user must ensure that in-stream flow, both upstream and downstream from the works, is measured on an ongoing basis by means of instruments and devices certified by the South African Bureau of Standards ("SABS"), and that such measurement commences at least one week prior to the initiation of the works, including for emergency alterations or the rectification of reportable incidents.

(o) During the carrying out of any works, the water user must take the photographs and video-recordings referred to in paragraph (p) below, on a daily basis, starting

one (1) week before the commencement of any works, including for emergency structures and the rectification of reportable incidents, and continuing for one (1) month after the completion of such works:

(p) The following videos recordings and photographs must be taken as contemplated in paragraph (o) above:

(i) one or more photographs or video-recordings of the watercourse and its banks at least 20 meters upstream from the structure;

(ii) one or more photographs or video-recordings of the watercourse and its banks at least 20 meters downstream from the structure; and

(iii) two or more photographs or video-recordings of the bed and banks at the structure, one of each taken from each opposite bank.

Rehabilitation

10. (1) Rehabilitation as contemplated in paragraph 6(1)(v) above must be conducted in terms of a rehabilitation plan and the implementation of the plan must be overseen by a suitably qualified SACNASP professional member.

(2) Upon completion of the construction activities related to the water use—

(a) a systematic rehabilitation programme must be undertaken to restore the watercourse to its condition prior to the commencement of the water use;

(b) all disturbed areas must be re-vegetated with indigenous vegetation suitable to the area; and

(c) active alien invasive plant control measures must be implemented to prevent invasion by exotic and alien vegetation within the disturbed area.

(3) Following the completion of any works, and during any annual inspection to determine the need for maintenance at any impeding or diverting structure, the water user must ensure that all disturbed areas are –

(i) cleared of construction debris and other blockages;

(ii) cleared of alien invasive vegetation;

(iii) reshaped to free-draining and non-erosive contours, and

(iv) re-vegetated with indigenous and endemic vegetation suitable to the area.

(4) Upon completion of any works, the water user must ensure that the hydrological functionality and integrity of the watercourse, including its bed, banks, riparian habitat and aquatic biota is equivalent to or exceeds that what existed before commencing with the works.

Monitoring and reporting

11. (1) The water user must ensure the establishment and implementation of monitoring programmes to measure the impacts on the resource quality to ensure water use remains within the parameters of paragraph 8(3)(m) to (o) and results are stored;

(2) Upon the written request of the responsible authority the water user must-

(a) ensure the establishment of any additional monitoring programmes; and

(b) appoint a competent person to assess the water use measurements made in terms of this General Authorisation and submit the findings to the responsible authority for evaluation.

(3) The water user shall monitor and determine present day values for water resource quality before commencement of water uses in terms of section 21(c) or (i) of the Act.

(4) Upon completion of construction activities related to the water use, the water user must undertake an Environmental Audit annually for three years to ensure that the rehabilitation is stable, failing which, remedial action must be taken to rectify any impacts.

(5) Rehabilitation structures must be inspected regularly for the accumulation of debris, blockages, instabilities and erosion with concomitant remedial and maintenance actions.

(6) Copies of all designs, method statements, risk assessments as done according to the Risk Matrix, rehabilitation plans and any other reports required must be made available to the responsible authority when requested to do so.

14

Budgetary provisions

12. (1) The water user must ensure that there is a sufficient budget to complete, rehabilitate and maintain the water use as set out in this General Authorisation.

(2) The Department may at any stage of the process request proof of budgetary provisions.

Registration

13. (1) Subject to the provisions of this General Authorisation, a person who uses water as contemplated in this General Authorisation must submit the relevant registration forms to the responsible authority.

(2) Upon completion of registration, the responsible authority will provide a certificate of registration to the water user within 30 working days of the submission.

(3) On written receipt of a registration certificate from the Department, the person will be regarded as a registered water user and can only then commence with the water use as contemplated in this General Authorisation.

(4) The registration forms can be obtained from DWS Regional Offices or Catchment Management Agency office of the Department or from the Departmental website: http\\www.dws.gov.za

Record-keeping and disclosure of information

14. (1) The water user must keep a record of all the documents referred to in paragraph 11 above for a minimum period of five years.

(2) The records referred to in this paragraph must be made available to the responsible authority upon written request.

15

Inspection

15. Any property in respect of which a water use has been registered in terms of this General Authorisation is subject to inspection in accordance with the relevant provisions of the Act.

Compliance by the water user

16. (1) The responsibility for complying with the provisions of this authorisation is lies with the water user.

(2) This General Authorisation is subject to the Act, any other applicable law, and regulation.

Repeal of Notices

17. This Notice replaces Government Notice 1199 published in Government Gazette 32805 dated 18 December 2009.

16

APPENDIX A: **RISK MATRIX (Based on DWS 2015 publication: Section 21 c and I water use Risk Assessment Protocol)**

Risk is determined after considering all listed control/mitigation measures. Borderline LOW/MODERATE risk scores can be manually adapted downwards up to a maximum of 25 points (from a score of 80) subject to listing of additional mitigation measures considered and listed in RED font.

						Severity							
No.	Phases	Activity	Aspect	Impact	Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph+Vegetation)	Biota	Severity				
1		Example: Clearing of vegetation in close proximity to or in a watercourse	Clearing Access roads for infrastructure	Impact posed by damage to bank. Loss of biodiversity & habitat; impeding the flow of the watercourse									

Risk being posed to "resource quality" as defined in the Act must be scored according to the Risk Rating Table for Severity. A Severity score is then generated.

Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal issues	Detection	Likelihood	Significance	Risk Rating

Consequence, Likelihood and finally Significance scores are automatically calculated with the rest of parameters according to respective Risk Rating Tables.

Risk Rating	Confidence level	Control Measures	Borderline LOW MODERATE Rating Classes	PES AND EIS OF Watercourse

RISK = CONSEQUENCE x LIKELIHOOD

CONSEQUENCE = SEVERITY + SPATIAL SCALE + DURATION LIKELIHOOD = FREQUENCY OF THE ACTIVITY + FREQUENCY OF THE IMPACT + LEGAL ISSUES + DETECTION

ONLY LOW RISK ACTIVITIES located within the regulated area of the watercourse will qualify for a GA according to this Notice. Medium and High risk activities will require a Section 21 (c) and (i) water use licence.

RISK ASSESSMENT KEY (Based on DWS 2015 publication: Section 21 c and i water use Risk Assessment Protocol)

Negative Rating

TABLE 1- SEVERITY

How severe does the aspects impact on resource quality (flow regime, water quality, geomorphology, biota, habitat)?

Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful and/or wetland(s) involved	5
Where "or wetland(s) are involved" it means that the activity is located within the delineated boundary of any wetland. The score of 5 is only compulsory for the significance rating.	

TABLE 2 – SPATIAL SCALE

How big is the area that the aspect is impacting on?

Area specific (at impact site)	1
Whole site (entire surface right)	2
Regional / neighboring areas (downstream within quaternary catchment)	3
National (impacting beyond secondary catchment or provinces)	4
Global (impacting beyond SA boundary)	5

ii

TABLE 3 – DURATION

How long does the aspect impact on the environment and resource quality?

One day to one month, PES, EIS and/or REC not impacted	1
One month to one year, PES, EIS and/or REC impacted but no change in status	2
One year to 10 years, PES, EIS and/or REC impacted to a lower status but can be improved over this period through mitigation	3
Life of the activity, PES, EIS and/or REC permanently lowered	4
More than life of the organisation/facility, PES and EIS scores, a E or F	5
PES and EIS (sensitivity) must be considered.	

TABLE 4 – FREQUENCY OF THE ACTIVITY

How often do you do the specific activity?

Annually or less	1
6 monthly	2
Monthly	3
Weekly	4
Daily	5

TABLE 5 – FREQUENCY OF THE INCIDENT/IMPACT

How often does the activity impact on the environment?

Almost never / almost impossible / >20%	1
Very seldom / highly unlikely / >40%	2
Infrequent / unlikely / seldom / >60%	3
Often / regularly / likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

TABLE 6 – LEGAL ISSUES

How is the activity governed by legislation?

No legislation	1
Fully covered by legislation (wetlands are legally governed)	5
Located within the regulated areas	

TABLE 7 – DETECTION

How quickly/easily can the impacts/risks of the activity be observed on the resource quality, people and property?

Immediately	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

TABLE 8: RATING CLASSES

RATING	CLASS	MANAGEMENT DESCRIPTION
[illegible]	[illegible]	[illegible]
55 – 169	M) Moderate risk	Risk will impact on watercourses are notably and require mitigation measures on a higher level, which can more and require specialist input. Licence required.
[illegible]	[illegible]	[illegible]

A low risk class must be obtained for all activities to be considered for a GA.

iv

TABLE 9: CALCULATIONS

Consequence = Severity + Spatial Scale + Duration
Likelihood = Frequency of Activity + Frequency of Incident + Legal Issues + Detection
Significance\Risk = Consequence X Likelihood

RISK ASSESSMENT MUST BE CONDUCTED BY A SUITABLY QUALIFIED SACNASP PROFESSIONAL MEMBER AND HE/SHE MUST:

1) CONSIDER BOTH CONSTRUCTION AND OPERATIONAL PHASES OF PROPOSED ACTIVITIES;
2) CONSIDER RISKS TO RESOURCE QUALITY POST MITIGATION CONSIDERING MITIGATION MEASURES LISTED IN TABLES PROVIDED;
3) CONSIDER THE SENSITIVITY (ECOLOGICAL IMPORTANCE AND SENSITIVITY – EIS) AND STATUS (PRESENT ECOLOGICAL STATUS - PES) OF THE WATERCOURSE AS RECEPTOR OF RISKS POSED;
4) CONSIDER POSITIVE IMPACTS/RISKS REDUCTION AS A VERY LOW RISK IN THIS ASSESSMENT;
5) INDICATE CONFIDENCE LEVEL OF SCORES PROVIDED IN THE LAST COLUMN AS A PERCENTAGE FROM 0 - 100%;
6) NAME AND REGISTRATION NUMBER OF SACNASP PROFESSIONAL MEMBER MUST BE PROVIDED ON EXCELL SPREADSHEET AND MUST BE SUBMITTED WITH REGISTRATION DOCUMENTATION.

ON THE EXCELL SPREADSHEET POP-UP COMMENTS ARE AVAILABLE FOR ALL COLUMNS IN THE HEADINGS WHICH EXPLAINS THE PURPOSE OF EACH COLUMN!

APPENDIX B: **Aspects that must be addressed in any RIVER MANAGEMENT PLAN as specified under paragraph 6 (1) (iv) of this Notice.**

River Management Plans for storm water and river management activities MUST:

Contain information on all the river and storm water management activities in terms of section 21(c) and (i) water uses of the Act with a section addressing all relevant supporting technical information used to ensure a LOW risk will be posed to the resource quality of the watercourses and that this management plan have been submitted to the relevant regional operations or Catchment Management Agency (CMA) office for APPROVAL. The report must include, but may not be limited to:

When developing a River Management Plan:

1. Identify River Management Plan domain, preferably from a whole-catchment perspective;
2. Identify an accountable, representative body that should take unbiased custodianship of the RMP and drive its implementation;
3. Identify key stakeholders;
4. Divide the river into useful management units;
5. Identify major drivers of river disturbance and instability – human and natural, and their primary and secondary effects;
6. Complete Risk assessment as per Risk Matrix (Appendix A) for identified mitigation activities;
7. Solicit input from stakeholders on their priorities and objectives;
8. Define best practice measures for rehabilitation and maintenance implementation;
9. Design a plan for ecological monitoring which is specifically linked to the stated objectives; and
10. Develop an implementation programme and review mechanism.

Report should contain supporting technical information used to ensure the low risk to resource quality like:

a) Impact assessment and mitigation report completed by an independent consultant as required by NEMA and NWA;
b) All the relevant specialist reports supporting the proposed mitigation measures;
   - Specialists Reports must address the level of modification/risk posed to resource quality ie: flow regime, water quality, geomorphological processes, habitat and biota of the watercourses and contain Present Ecological state (PES) and Ecological importance and Sensitivity (EIS) data for relevant watercourses;

c) Environmental management plan giving effect to all actions required to mitigate impacts (What, When, Who, Where and How);
d) Best practices applicable to these activities, where applicable;
e) Generic designs and method statements, where applicable;
f) Norms and standards, where available;

vi

g) Monitoring programme that must include "present day" conditions to be used as base line values;
h) Monitoring, auditing and reporting programme (reports must be send on request to the region or CMA); and;
i) Internalized controls and auditing, where applicable.

PLEASE NOTE: Any activities outside the scope of the approved plan that is required for river – or storm water management (example: building of new gabion structures to stop bank erosion) must comply to all the provisions in **paragraph 6** of this notice.

vii

CONTINUES ON PAGE 130 - PART 2

Government Gazette
Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID AFRIKA

Vol. 614 26 August / Augustus 2016 No. 40229

PART 2 OF 2

ISSN 1682-5843

9 771682 584003 40229

AIDS HELPLINE: 0800-0123-22 Prevention is the cure

APPENDIX C: **EMERGENCY PROTOCOL as specified under paragraph 6 (1) (vi) of this Notice.**

Purpose of the "Emergency Protocol"

The purpose of this protocol is to set out the process to be followed and actions to be taken by any person to provide assurance to the DWS in ensuring emergency incidents and situations can be responded to, while at the same time ensuring compliance to the requirements of the National Water Act. Failure to comply to these requirements will be dealt with in terms of section 19 or 20 of the National Water Act (NWA)(Act 36 of 1998).

The agreement relates to situations where any person or entity is required to immediately respond by taking necessary action to an emergency situation or incident. It is noted that this does not include routine or planned maintenance or to deal with poor project planning.

Emergency Protocol:

This "Emergency Protocol" spells out what protocol needs to be followed to remedy "emergency situations and incidents". In terms of Section 67 of the National Water Act' *Dispensing with certain requirements of Act'* the NWA states the following:

(1) In an emergency situation, or in cases of extreme urgency involving the safety of humans or property or the protection of a water resource or the environment, the Minister may

(a) dispense with the requirements of this Act relating to prior publication or to obtaining and considering public comment before any instrument contemplated in section 158(1) is made or issued;

(b) dispense with notice periods or time limits required by or under this Act;

(c) authorise a water management institution to dispense with

(i) the requirements of this Act relating to prior publication or to obtaining and considering public comment before any instrument is made or issued; and

(ii) notice periods or time limits required by or under this Act.

(2) Anything done under subsection (1)

(a) must be withdrawn or repealed within a maximum period of two years after the emergency situation or the urgency ceases to exist; and

(b) must be mentioned in the Minister's annual report to Parliament."

(3) An incident is an event that requires immediate attention that might lead to potential disruption of service delivery.

viii

Examples include the following:

Replacement of stolen or vandalised or damaged underground cables or, overhead power lines, burst pipelines, flooded or damaged bridges and /or related infrastructure, the replacement of/or repairs to damaged infrastructure.

Described below is the process to be followed and definitions.

Process to respond to an Emergency that has a water use implication in terms of section 21 water uses of the NWA.

Definitions:

Emergency incident and situations as defined in this notice read together with section 20 and 67 of the NWA.

Protocol to be followed:

Any person that must attend to an emergency must notify the regional office or CMA about the emergency immediately and provide all required documents to the relevant region(s) within 1 month thereafter according to the specified protocol in this document. Should the incident take place over a weekend or public holiday (outside DWS working hours), the documents can be forwarded to DWS and receipt be followed-up on the day after the weekend or holiday.

1) **Relevant DWS regional office to be notified about the** emergency incident or situation (hereafter referred to as an Emergency) by means of an email and or 24 hour hotline of DWS. The document emailed must as a minimum contain the following information:
   a. Date of occurrence of the emergency;
   b. Date at which any person became aware of the emergency;
   c. Nature of emergency;
   d. A motivation and definition of the emergency;
   e. Description, location and receiving environment sensitivity of the emergency;
   f. Description of short, medium and long term actions, environmental management and rehabilitation, and emergency plan required to be taken to respond to the emergency;
   g. Date(s) when the actions will be taken (or have taken place);
   h. Contract details of responsible persons.
2) The following is a list of the required information that must be submitted to the relevant CMA or regional office of DWS within 1 month following the Emergency response to enable the regional office or CMA to determine whether the activities qualifies for a GA in terms of this Notice or whether a *post facto* licence will be required.

ix

Tabulated list of information required to be submitted within a maximum of 1 month after the occurrence of the "Emergency":

Table of Contents

Compliance to this Emergency Protocol does not absolve any person from complying to the requirements of any other laws and associated regulations.

x

APPENDIX D1: **Activities that are generally authorized for any person subject only to compliance to the conditions of this Notice.**

Any person	ACTIVITY
Farmers and any other land owners	Emergency river crossings for vehicles to gain access to livestock, crops or residences etc.
Any landowner	Maintenance to private roads and river crossings provided that footprint remains the same and the road is less than 4 m wide.
Any landowner	Erection of fences provided that the fence will not in any way impede or divert flow, or affect resource quality detrimentally in the short, medium to long term.

APPENDIX D2: **Activities that are generally authorized for SOC's and institutions subject only to compliance to the conditions of this Notice.**

SOC's, INSTITUTION or Individual	ACTIVITIES
ESKOM and other institutions	**Construction of new** transmission and distribution power lines, and **minor maintenance** of roads, river crossings, towers and substations where footprint will remain the same.
SANPARKS and provincial conservation agencies	All bridges, low water bridge crossings and pipe lines below 500 mm in diameter.
SANRAL and other provincial Departments of Transport or municipalities.	All maintenance of bridges over rivers, streams and wetlands and new construction of bridges done according to SANRAL Drainage Manual or similar norms and standards.
TRANSNET and other institutions	All 1.5 meter diameter and smaller pipe lines (*except pipelines excluded in terms of this Notice - paragraph 3 (e)*) and maintenance of railway line crossings of rivers and wetlands outside the boundary of a wetland.
Gautrain Management Agency	Maintenance of existing infrastructure and expansion to crossings of rivers within the existing servitude.
TELKOM and other communication companies	All cables crossing rivers and wetland outside delineated wetland boundary.
RAND WATER and other water boards	All raw water 1.5 meter diameter and smaller pipe lines crossings river and wetlands outside delineated wetland boundary.
Municipalities and other institutions.	Mini-scale hydropower developments with a maximum capacity of 10kW – 300kW. (*Read together with General notice 665 of 6 Sept 2013 General Authorisation section 21 (e) or as amended*) These hydropower plants will provide basic, non-grid electricity to rural communities and agricultural land and must in no way affect the flow regime, flow volume and/or water quality including temperature.

Annexure F: New Environmental Management Programme (EMPr) compiled by SRK Consulting dated June 2016, for additional infrastructure and powerlines

6 Environmental Management Programme

The FAD 6 project at Sasol Secunda is legally bound to comply with the following:

- FAD 6 EMPr as approved in the Environmental Authorisation under the National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended;
- Conditions specified in the Environmental Authorisation issued in terms of NEMA;
- FAD 6 EMPr as approved in the Waste Licence issued in terms of the National Environmental Management Waste Act (Act No. 59 of 2008) (NEM-WA), as amended;
- Conditions specified in the FAD 6 Waste Licence issued in terms of NEM-WA;
- Conditions specified in the FAD 6 WUL.

6.1 Wetland and Water Resource Management Measures

The wetland and water resource management plan for the FAD 6 project is presented in Table 6-1. This plan has been developed based on the identified potential impacts associated with the FAD 6 Project. Certain measures apply to more than one aspect so some repetition is unavoidable.

Table 6-1: Wetland and Water Resource Management Plan

ID	Environmental Aspect	Mitigation/Management Measures
1	Riparian/Wetland Areas	• Sasol Secunda employees should be informed on the location of the wetland habitats and their sensitivity as part of the induction process prior to starting work on site; • Construction workers should be informed on the location of the wetland habitats and their sensitivity as part of the induction process prior to starting work on site; • Where construction takes place within wetlands or immediately adjacent to wetlands, hay bales, sediment nets, silt fences, or other measures should be placed downslope of construction activities to trap any sediment washed off these areas by surface run-off; • Mixing of lubricants will be on the non-pervious layer at least 20m from the wetland edge; • In some instances locally, available resources may be utilized in the implementation of wetland rehabilitation activities. This would primarily be rocks for the construction of gabion structures; • Following completion of construction activities a clean-up and rehabilitation program should be implemented for all wetlands located adjacent to the construction servitudes, for a minimum of 200 m upstream and downstream thereof; • Sasol Secunda has obtained Environmental Authorisation for the construction and operation of FAD 6. Further extension of the current FAD 6 footprint will be subject to a Wetland assessment in terms of the legislation for which provision of appropriate mitigation and management measures will be provided; • Ensure that the project specific related waste and runoff do not affect the riparian features and associated buffer zones by implementing the applicable mitigation measures under ID 2.
2	Aquatic Environment	• Sensitive areas outside of the footprints of the facilities will be demarcated, fenced and left undisturbed during construction, operation and decommissioning; • If sensitive areas cannot be fenced off, it shall be clearly demarcated with commercially available danger tape or suitable equivalent; • Sasol Secunda will regularly review the biomonitoring of the downstream watercourse, to assess requirements to further reduce the impacts of the FAD 6 system on the environment; • Where construction takes place within wetlands or immediately adjacent to wetlands, hay bales, sediment nets, silt fences, or other

ID	Environmental Aspect	Mitigation/Management Measures
		measures should be placed downslope of construction activities to trap any sediment washed off these areas by surface run-off; • Any spills will be cleaned up as soon as possible and disposal of contaminated material will be managed in an appropriate way; • All pollution control facilities must be managed in such a way as to ensure that storage and surge capacity is available if a rainfall event occurs; • No direct discharge of polluted water to the environment is permitted, other than may be provided for in the WUL, and under appropriate control in terms of the WUL; • Sasol Secunda will regularly review the surface monitoring data collected for the operation of FAD 6, to assess requirements to further reduce the impacts of the FAD 6 system on the environment.

3	Surface Water (including stormwater)	• Stormwater runoff will be handled on surface and directed towards natural watercourses;
		• Contaminated runoff water, generated during rainstorm events, on the operational footprint area will be routed back to existing CAE system;
		• Ensure that project specific clean water diversions continue to route the water towards the local water course;
		• Stormwater culverts and clean water diversions will be designed and constructed to accommodate the 1:50 year storm event;
		• Adequate protection measures at river crossings will be included in the relevant designs;
		• Oil/diesel leaks and spillages of any designated hazardous waste will be cleaned up as soon as possible;
		• To minimise the impact of reduced flows within the downslope wetlands, the area excluded from the wetlands catchment by the dams and associated operational management area should be kept as small as possible;
		• Sasol Secunda's current surface water monitoring system will be applied in terms of the FAD 6 WUL. Should contamination exceed predicted levels for trigger leakage rates, Sasol Secunda will immediately notify the relevant authorities. Sasol Secunda will then:
		  • Identify the source of the contamination;
		  • Identify and implement measures for the prevention of this contaminant;
		  • Determine if additional remedial measures are required;
		• All purchased rock shall be from registered and approved crushers. Copies of shall be kept on file by the implementer;
		• A record must be kept of all spills and the corrective action taken;
		• The contractor shall ensure that fuels and chemicals (e.g. drums of fuel, grease, oil, brake fluid, hydraulic fluid) are stored and handled carefully to prevent spillage. These liquids shall be confined to specific and secured areas within the contractor's camp and shall be clearly marked. The liquids shall be stored in a bunded area with adequate containment with an impermeable floor beneath them for potential spills or leaks, in such a way that does not pose any danger of pollution even during times of high rainfall;
		• Ensure clean and dirty water segregation is implemented as per the FAD 6 Water Use License, and the FAD 6 design basis;
		• Sasol Secunda will regularly review the surface monitoring data collected for the operation of FAD 6, to assess requirements to further reduce the impacts of the FAD 6 system on the environment;
		• Cleared areas shall be stabilised as soon as possible;

ID	Environmental Aspect	Mitigation/Management Measures

		• Vehicles:
		  • Site vehicles shall only permitted within the demarcated FAD 6 site and existing Sasol Secunda secondary security area, as required, to complete their specific task;
		  • All construction vehicles shall be in a good working order to reduce possible noise pollution;
		  • On-site vehicles shall be limited to approved access routes and areas (including turning circles and parking) on the site so as to minimise excessive environmental disturbance to the soil and vegetation on site;
		  • All vehicles (including trailers) used by projects shall comply with all legal requirements in terms of roadworthiness and licensing and shall display a valid license at all times.
		  • Servicing and maintenance of vehicles on-site shall be avoided as far as possible;
		• Equipment:
		  • Drip trays shall be put in place in relevant locations (inlets, outlets, points of leakage, etc.) so as to prevent spillage or leakage during transfer;
		  • The contractor shall stand any equipment that may leak, and does not have to be transported regularly on watertight drip trays to catch any pollutants;
		  • The drip trays shall be of a size that the equipment can be placed inside it;
		  • Drip trays shall be cleaned regularly and shall not be allowed to overflow;
		• Substances, which cannot be reused, shall be disposed of according to the relevant waste disposal procedure;
		• A specialist waste contractor shall dispose of any hazardous waste off-site at a licensed hazardous waste disposal site;
		• The contractor shall be responsible for ensuring that any party delivering potentially dangerous chemicals and oil to site is aware of the appropriate storage and drop-off locations and procedures. Transfer of hazardous chemicals and other potentially hazardous substances shall be carried out so as to minimise the potential leakage and prevent spillage onto the soil;
		• Appropriate signage shall be erected indicating the refuelling and storage areas;
		• The contractor shall keep the necessary materials and equipment on site to deal with spillage of the relevant hazardous substances present on site;
		• Further measures to reduce sediment generated from construction activities include ensuring that soil is not deposited into a watercourse and the re-vegetation of the exposed areas as soon as possible;
		• Refuelling of vehicles shall only take place at a predetermined area, where adequate pollution prevention measures are in place;
		• A containment berm is to be constructed around the main material stockpile to prevent stormwater to come into contact with the ash.

4	Groundwater	• All purchased rock shall be from registered and approved crushers. Copies of shall be kept on file by the implementer; • A record must be kept of all spills and the corrective action taken; • Sasol Secunda will regularly review the groundwater monitoring data collected for the operation of FAD 6, to assess requirements to further reduce the impacts of the FAD 6 system on the environment; • In preparation of the main ash stockpile area, the topsoil is to be removed and the clay is to be ripped and re-compacted to form a

ID	Environmental Aspect	Mitigation/Management Measures
		low permeability liner that will reduce seepage to the groundwater beneath before any ash deposition to the area occur; • A containment berm is to be constructed around the main material stockpile to prevent stormwater to come into contact with the ash.
5	Biodiversity: Flora	• A sensitivity map has been developed for the study area, indicating areas, which are considered to be of increased ecological importance. It is recommended that this sensitivity map be considered during all development phases to aid in the conservation of floral diversity within the study area; • Clearance of vegetation to be restricted to that required to facilitate the execution of the works; • No stockpiling, dumping or storage of equipment or materials should be allowed within the demarcated sensitive areas; • No movement of vehicular or human traffic should be allowed in any wetlands demarcated to be protected; • Any spillage from vehicles should be cleaned up immediately; • No vegetation to be disposed of by burying or burning without the requisite permit from local authority; • Vegetation clearance will only be conducted within the authorised site footprint (including that area required for the construction activities) and disturbance will be minimized as far as feasible; • Prohibit use of herbicides or pesticides within 100 m of any wetland and other water resources; • An alien invasive eradication plan should be developed and include, but not be limited to the following: • Care should be taken with the choice of herbicide to ensure that no additional impact or loss of indigenous plant species occurs due to the use of the herbicide; • Footprint areas should be kept as small as possible when removing alien plant species; • No vehicles should be allowed to drive through riparian areas during the eradication of alien and weed species; • Removal of alien and weed species must take place in accordance with existing legislation process and procedures.
6	Biodiversity: Fauna	• A sensitivity map has been developed for the study area, indicating areas, which are considered to be of increased ecological importance. It is recommended that this sensitivity map be considered during all development phases to aid in the conservation of floral diversity within the study area; • All development footprint areas and areas affected by the proposed development should remain as small as possible and should not encroach unnecessarily into the surrounding sensitive areas and the associated buffer zones; • Informal fires in the vicinity of FAD 6 Project should be prohibited throughout the life of the project; • During induction of all personnel and contractors, awareness training in terms of floral species is recommended to increase awareness, respect and responsibility towards the environment; • It is recommended that a speed limit of 40 km/h is implemented on all roads running through the project area in order to minimise risk to faunal species from vehicles. Speed humps may be constructed to help slow vehicles and help mitigate collision with faunal species; • During induction of all personnel and contractors, awareness training in terms of faunal species is recommended to increase awareness, respect and responsibility towards the environment; • No trapping or hunting of fauna is to take place; • It must be ensured that migratory connectivity between sensitive areas is maintained where possible.

ID	Environmental Aspect	Mitigation/Management Measures

7	Soils, Land Use and Land Capability	• Top soil must be stripped within working areas;
		• Topsoil must be stored separately from subsoil and used for subsequent rehabilitation and revegetation;
		• Topsoil stockpiles shall not be compacted;
		• All cleared vegetation shall either be mulched and mixed into the topsoil stockpiles or disposed of at an approved disposal site;
		• A record must be kept of all spills and the corrective action taken;
		• All contractor vehicles shall be stored in a location where an oil trap shall be installed to prevent soil pollution or will be stored with a drip tray underneath them;
		• Cleared areas shall be stabilised as soon as possible;
		• All cleared vegetation shall either be mulched and mixed into the topsoil stockpiles or disposed of at an approved disposal site;
		• All impacted areas outside of the footprints of the facilities shall be rehabilitated (loosen soil and re-vegetate) once work has been completed and prior to the construction team leaving the site. These activities shall include the closure and rehabilitation of temporary access;
		• The implementation of adequate stormwater controls to reduce water velocity will mitigate erosion. These controls could include:
		  • earth berms, bunds and/or channels;
		  • energy dissipaters such as gabions;
		  • introduce vegetation; etc.
		  • limit construction vehicles and personnel movement to project specific dedicated access roads.

6.2 Infrastructure Specific Environmental Management Programme

In addition to the management measures listed in Table 6-1, Table 6-2 summarises the infrastructure specific3 management measures to be implemented to further reduce the risk on water resources associated with the infrastructure/activities.

[3] The risk ratings associated with the trenched electrical cables (E11 and E12), the overhead electrical cables (E15 and E16), the supporting infrastructure (SI1 – SI3), the materials stockpiles (S4 – S6) and the dolerite pit (S7) were amended manually after the implementation of additional mitigation measures (highlighted in red) from a risk rating of MODERATE to LOW.

Table 6-2: Infrastructure Specific Management Measures[4]

Infrastructure	Management Measure
Fences	• Where a fence is to traverse a wetland, that fence will be designed to have a minimal effect on the flow of water through the wetland; • Except for the security fences, other fences should allow for the migration of small fauna; • Areas disturbed by linear construction activities shall be rehabilitated on completion of construction of each area; • After heavy rainfall events, fences should be inspected and any debris removed.
Roads	• The security ring road has been designed to have a 2 % cross fall towards an edge drain on the side of the road. Where the ground falls steeper than 1:50, drop catchments are constructed every 100 m along the drain in order to divert the storm water out of the site to the clean catchment by a pipe underneath the road. Where slope is gentler, the drains are constructed at 150 m centres. The runoff from the road has been assumed clean as it is only used for security and maintenance vehicles; • Stormwater runoff will be handled on surface and directed towards natural watercourses; • The footprint of the area to be covered by temporary stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • The diversion outlets will be placed such that the diverted flow enters the natural system where possible at an acute angle to prevent the creation of turbulent flow; • Appropriate erosion and sediment control measures should be implemented; • Care shall be taken to ensure that construction methods do not increase the silt load of the riparian zone; • All purchased rock shall be from registered and approved crushers. Copies of shall be kept on file by the implementer; • Roadsides verges and drainage courses within the boundaries of FAD 6 should be encouraged to develop suitable indigenous vegetation that will be able to grow in the area; • The contractors undertaking activities for the development of FAD 6, and Outside Ash business units responsible for the operation of FAD 6 will ensure that the handling, storage, transportation, treatment and disposal of its wastes are compatible with the waste management practices and do not create unaccounted for safety risks to public roads. If wastes are found to be non-compatible with specific road transportation practices, appropriate alternative road transportation must be applied; • Sufficient erosion and scour protection measures to be put in place to minimise impacts on riparian zones; • Areas disturbed by linear construction activities shall be rehabilitated on completion of construction of each area; • Operate and maintain infrastructure according to the Environmental Authorisation and WUL conditions; • Conduct routine inspections and scheduled maintenance. Implement corrective actions as indicated from inspection findings.

[4] The risk ratings associated with the trenched electrical cables (E11 and E12), the overhead electrical cables (E15 and E16), the supporting infrastructure (SI1 – SI3), the materials stockpiles (S4 – S6) and the dolerite pit (S7) were amended manually after the implementation of additional mitigation measures (highlighted in RED) from a risk rating of MODERATE to LOW.

Infrastructure	Management Measure
Trenched Electrical Cables	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • The footprint of areas to be covered by temporary stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • Appropriate erosion and sediment control measures should be implemented; • Areas disturbed by linear construction activities shall be rehabilitated on completion of construction of each area; • Care shall be taken to ensure that construction methods do not increase the silt load of the riparian zone; • When excavated material is to be used as backfill to culverts, the width of the excavation should allow clearances on either side of the culvert to ensure that the side fill can be adequately compacted; • The load carrying capacity of a filled trench is dependent upon the lateral support of the side fill material. Side fill material must be carefully placed so that there are no voids in it and to a density sufficient to give the required lateral support; • Once initial backfill has been completed, the remainder of the backfill should be completed in layers not exceeding 300 mm in thickness compacted to specified density or as directed by the design engineer; • Where the trench crosses a road or may have to support a future structure, the backfill may be placed in layers not exceeding 150 mm in thickness and compacted in the same density as the road layers. When the side fill has been completed, backfilling should continue until the selected fill blanket is placed and completed to the required thickness (usually 300 mm minimum) above the top of the culvert. The design engineer requirements must however be met first; • Compaction shall be carried out by means of suitable equipment; • Consideration must be given to not placing material stockpiles directly adjacent to open trenches, to avoid surcharging the trench walls and possibly causing collapse; • Attenuation of stormwater runoff should be undertaken at strategic points to slow down the flow velocity and hence prevent the build-up of high energy sections which then causes erosion and incision of the natural watercourse; • Where trenches need to be excavated for electrical cables, the area of disturbance must be limited; • Topsoil must be stored separately and measures implemented to ensure that topsoil do not erode.
Overhead Electrical Cables (New Supporting Infrastructure)	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • The footprint of areas to be covered by temporary stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • The diversion outlets will be placed such that the diverted flow enters the natural system where possible at an acute angle to prevent the creation of turbulent flow; • Where a power line is to traverse a wetland, that power line will be designed to have a minimal effect on the flow of water through the wetland; • Areas disturbed by linear construction activities shall be rehabilitated on completion of construction of each area; • Water in excavations can cause several problems and must be managed; • Topsoil must be stored separately and measures implemented to ensure that topsoil do not erode.

Infrastructure	Management Measure
Slurry pipeline	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • The footprint of areas to be covered by temporary stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • The diversion outlets will be placed such that the diverted flow enters the natural system where possible at an acute angle to prevent the creation of turbulent flow; • Appropriate erosion and sediment control measures should be implemented; • Remove only the vegetation where essential for the continuation of the canals/pipeline. Do not allow any disturbance to the adjoining natural vegetation cover or soils; • Areas disturbed by linear construction activities shall be rehabilitated on completion of construction of each area; • Care shall be taken to ensure that construction methods do not increase the silt load of the riparian zone; • Pipelines and associated pump stations, and drainage channels, transferring wastewaters and waste will be inspected regularly and maintained to minimise risk of spillage; • Pipelines and associated pump stations transferring Return Water from the FAD 6 back to Sasol Secunda will be regularly inspected and maintained to minimize risk of spillage; • Spillages posing a significant risk to the environment will be managed in accordance with the Synfuels Incident Management Procedure; • Spillages that are considered by Sasol Secunda to pose a threat to the external environment with be reported to DEA and DWS as incidents, for which appropriate remedial measures will be timeously implemented and reported; • Where a pipeline is to traverse a wetland, that pipeline will be designed to have a minimal effect on the flow of water through the wetland.
Supporting Infrastructure: Service corridors	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • The footprint of areas to be covered by temporary stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • The diversion outlets will be placed such that the diverted flow enters the natural system where possible at an acute angle to prevent the creation of turbulent flow; • Appropriate erosion and sediment control measures should be implemented; • Areas disturbed by linear construction activities shall be rehabilitated on completion of construction of each area; • Care shall be taken to ensure that construction methods do not increase the silt load of the riparian zone; • In addition to the management measures listed in Table 6-1, the specific management measures applicable to fences, roads and slurry pipelines listed in Table 6-2 need to be adhered to.

Infrastructure	Management Measure
Ablution Facility	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • Appropriate erosion and sediment control measures should be implemented; • Sasol Secunda will ensure that sanitation facilities of FAD 6 do not cause water pollution or health hazards; • Sufficient toilets will be provided for the site operators that will be on site in line with building codes (i.e. 1 toilet for every 15 staff members on site); • The integrity of the conservancy tanks must be checked on a regular basis; • The levels in the conservancy tank must be checked on a regular basis to prevent overflow; • Sewage must be removed from the conservancy tank on a regular basis and disposed of at a registered wastewater treatment works; • Records of waste disposal must be kept on record; • No sewage is allowed to be discharged to the environment.
Top Soil Stockpile Areas	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • The footprint of areas to be covered by temporary stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • The diversion outlets will be placed such that the diverted flow enters the natural system where possible at an acute angle to prevent the creation of turbulent flow; • Appropriate erosion and sediment control measures should be implemented; • Dust control measures shall include regular spraying of working/exposed areas with water at an application rate that will not result in soil erosion or runoff in order to reduce dust emissions; • Top soil stockpiles shall be wetted and/or sheltered from the wind with a cover, if required; • All cleared vegetation shall either be mulched and mixed into the topsoil stockpiles or disposed of at an approved disposal site; • Top soil shall be stockpiled separately from subsoil and used for subsequent rehabilitation and revegetation; • Top soil shall not be compacted; • Stockpiles shall be located away from sensitive hydrological features (including but not limited to dams, wetlands, watercourses, ponds, pans, drainage channels, etc.); • Stockpiles of construction materials must be clearly separated from topsoil stockpiles in order to limit any contamination of the topsoil; • Stockpiles shall be stabilised if signs of erosion are visible; • Erosion control measures such as silt fences must be placed around the stockpiles; • Topsoil stockpile areas will be rehabilitated in their entirety.

Infrastructure	Management Measure
Clay Stockpile Areas	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • The footprint of areas to be covered by any temporary stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • The diversion outlets will be placed such that the diverted flow enters the natural system where possible at an acute angle to prevent the creation of turbulent flow; • Appropriate erosion and sediment control measures should be implemented; • Dust control measures shall include regular spraying of working/exposed areas with water at an application rate that will not result in soil erosion or runoff in order to reduce dust emissions; • Clay stockpiles shall be wetted and/or sheltered from the wind with a cover, if necessary; • Stockpiles shall be located away from sensitive hydrological features (including but not limited to dams, wetlands, watercourses, ponds, pans, drainage channels, etc.); • Stockpiles of construction materials must be clearly separated from clay stockpiles in order to limit any contamination of the clay; • Stockpiles shall be stabilised if signs of erosion are visible; • Erosion control measures such as silt fences must be placed around the stockpiles; • Clay stockpiles will be rehabilitated in its entirety.
Material Stockpiles	• In preparation of the ash stockpile areas, the topsoil is to be removed; • A containment berm is to be constructed around the main material stockpile to prevent stormwater from coming into contact with the ash; • The footprint of areas to be covered by the containment water berm will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • Appropriate erosion and sediment control measures should be implemented; • Dust control measures shall include regular spraying of working/exposed areas with water at an application rate that will not result in soil erosion or runoff in order to reduce dust emissions, if required; • Material stockpiles shall be wetted and/or sheltered from the wind with a cover, if required; • Stockpiles shall be located away from sensitive hydrological features (including but not limited to dams, wetlands, watercourses, ponds, pans, drainage channels, etc.); • Stockpiles shall be stabilised if signs of erosion are visible; • Material stockpiles to be will be rehabilitated in their entirety;

Infrastructure	Management Measure
Dolerite Borrow Pit	• Stormwater should be prevented from entering the excavation by forming a berm or trench around the edges to lead water away. These berms must be compacted or tamped down sufficiently to prevent them from being washed away; • The footprint of areas to be covered by any stormwater management berms will be cleared of vegetation and topsoil. The cleared topsoil will be stockpiled at least 100 m outside of any watercourse boundaries. The topsoil will then later be spread over the disturbed areas for vegetation to establish. If required, it will be hydro-seeded; • Appropriate erosion and sediment control measures should be implemented; • The entire work site must be monitored regularly for evidence of erosion; • Areas susceptible to erosion should be protected by installing adequate temporary and permanent drainage works as soon as possible and by taking measures to prevent the surface water from being concentrated in streams and from scouring slopes, banks or other areas; • Dewatering of excavations must be undertaken where necessary; • Any damage to stabilised areas shall be restricted and controlled; • Stormwater measures need to be implemented to prevent clean water from entering the pits; • Any complaints received by the Contractor regarding noise will be recorded and communicated to the Project Manager; • After the end of mining of the borrow pit outside the FAD 6 construction footprint, it will be rehabilitated.

6.3 Rehabilitation Plan

The rehabilitation plan to address post-construction rehabilitation and closure with the objective of facilitating water resource protection is presented in Table 6-3.

Table 6-3: Rehabilitation Plan for the Proposed FAD 6 Project Infrastructure

Aspect	Rehabilitation Measure
General Study Site	• Minimise the area of clearing to the minimum area safe for construction and operation; • Ensure the removal/control of residual hazardous materials; • Ensure ongoing rehabilitation of all contaminated and/or degraded land as soon as a disturbing activity has ceased or as soon as a component (aspect), no longer required for the FAD 6 Project, is removed; • Ensure the rehabilitation of all disturbed land, as far as practical, to its natural state or predetermined and agreed standards or land uses that conform to the concept of sustainable development; • Implement and monitor all required rehabilitation phases (depending on the degree of degradation to the land) including demolition (progressive and at final closure), remediation (land, surface water and groundwater), improving the condition of these media through soil replacement and revegetation; • Ensure mitigation of residual impacts, including ensuring the long-term stability and safety of the entire project footprint, as well as its capacity to withstand long-term wind and water erosion; • Where infrastructure can be decommissioned and the footprint can be rehabilitated the post-closure land use will be wilderness.
Infrastructure	• Ensure demolition of temporary infrastructure (such as during construction of projects prior to being commissioned and handed over) and other remaining infrastructure (except those identified to remain for use by communities post-closure), breaking of foundations, removal of all equipment and facilities from the project footprint; • Following demolition of the infrastructure the footprint will be reclaimed for the establishment of pre-construction land use.

Aspect	Rehabilitation Measure
Soils and Land Capability	• Where possible and practical, backfill all unsafe trenches and holes as far as practicable to ensure that no slopes exceed a gradient of 1:3; • Ensure soil stripping and stockpiling (top and subsoil separated where possible) conserves and maintains integrity of the topsoil; • All soils compacted as a result of the pre-construction activities falling outside the infrastructure footprint areas should be ripped and profiled; • During construction, the necessary and appropriate erosion control measures will be implemented at erodible areas to minimise erosion; • If soil becomes degraded, improve soil fertility through addition of ameliorants to create a sufficient growth medium for rehabilitation; • Footprints to be ploughed parallel to the contours after soils and ameliorants have been placed to mitigate compaction, which may have occurred during soil placement.
Riparian Areas	• All project affected riparian features should be visually inspected and monitored for erosion and incision on a monthly basis, and immediately after heavy rainfall events; • Ongoing biomonitoring in the vicinity of the study area must take place at points located upstream and downstream of the project activities. Biannual (twice a year) biomonitoring should be undertaken. Should any deviation of the normal trend be identified, measured to minimise or prevent any significant negative impacts should be implemented.

Annexure G: Environmental Management Plan (EMP) for General Authorisation (GA) 509 of 26 August 2016 for additional infrastructure and powerlines, issued by Department of Water and Sanitation (DWS)

7 Environmental Management Programme

The FAD 6 project at Sasol Secunda is legally bound to comply with the following:

- FAD 6 EMPr as approved in the Environmental Authorisation under the National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended;
- Conditions specified in the Environmental Authorisation issued in terms of NEMA, as amended;
- FAD 6 EMPr as approved in the Waste Licence issued in terms of the National Environmental Management Waste Act (Act No. 59 of 2008) (NEM:WA), as amended;
- Conditions specified in the FAD 6 Waste Licence issued in terms of NEM:WA;
- GNR 509 of 2016 for water uses approved as General Authorisations.

7.1 Wetland and Water Resource Management Measures

The wetland and water resource management plan for the FAD 6 project is presented in Table 7-1. This plan has been developed based on the identified potential impacts associated with the FAD 6 Project, including the electrical cables. Certain measures apply to more than one aspect so some repetition is unavoidable.

Table 7-1: Wetland and Water Resource Management Plan

ID	Environmental Aspect	Mitigation/Management Measures
1	Riparian/Wetland Areas	• Sasol Secunda employees should be informed on the location of the wetland habitats and their sensitivity as part of the induction process prior to starting work on site; • Construction workers should be informed on the location of the wetland habitats and their sensitivity as part of the induction process prior to starting work on site; • Where construction takes place within wetlands or immediately adjacent to wetlands, hay bales, sediment nets, silt fences, or other measures should be placed downslope of construction activities to trap any sediment washed off these areas by surface run-off; • Mixing of lubricants will be on the non-pervious layer at least 20 m from the wetland edge; • In some instances locally available resources may be utilized in the implementation of wetland rehabilitation activities. This would primarily be rocks for the construction of gabion structures; • Following completion of construction activities a clean-up program should be implemented for areas located adjacent to the construction servitudes; • Ensure that the project specific related waste and runoff do not affect the riparian features and associated buffer zones by implementing the applicable mitigation measures under ID 2.
2	Aquatic Environment	• Sensitive areas outside of the footprints of the facilities will be demarcated, fenced and left undisturbed during construction, operation and decommissioning; • If sensitive areas cannot be fenced off, it shall be clearly demarcated with commercially available danger tape or suitable equivalent; • Where construction takes place within wetlands or immediately adjacent to wetlands, hay bales, sediment nets, silt fences, or other measures should be placed downslope of construction activities to trap any sediment washed off these areas by surface run-off; • Any spills will be cleaned up as soon as possible and disposal of contaminated material will be managed in an appropriate way; • No direct discharge of polluted water to the environment is permitted.
3	Surface Water (including stormwater)	• Stormwater runoff will be handled on surface and directed towards natural watercourses; • Ensure that project specific clean water diversions continue to route the water towards the local water course;

ID	Environmental Aspect	Mitigation/Management Measures

		• Stormwater culverts and clean water diversions will be designed and constructed to accommodate the 1:50 year storm event;
		• Adequate protection measures at river crossings will be included in the relevant designs (Please refer to Method Statements included in Appendix 6);
		• Oil/diesel leaks and spillages of any designated hazardous waste will be cleaned up as soon as possible;
		• All purchased rock shall be from registered and approved crushers. Copies of shall be kept on file by the implementer;
		• A record must be kept of all spills and the corrective action taken;
		• The contractor shall ensure that fuels and chemicals (e.g. drums of fuel, grease, oil, brake fluid, hydraulic fluid) are stored and handled carefully to prevent spillage. These liquids shall be confined to specific and secured areas within the contractor's camp and shall be clearly marked. The liquids shall be stored in a bunded area with adequate containment with an impermeable floor beneath them for potential spills or leaks, in such a way that does not pose any danger of pollution even during times of high rainfall;
		• Ensure clean and dirty water segregation is implemented;
		• Cleared areas shall be stabilised as soon as possible;
		• Vehicles:
		  • Site vehicles shall only permitted within the demarcated FAD 6 site and existing Sasol Secunda secondary security area, as required, to complete their specific task;
		  • All construction vehicles shall be in a good working order to reduce possible noise pollution;
		  • On-site vehicles shall be limited to approved access routes and areas (including turning circles and parking) on the site so as to minimise excessive environmental disturbance to the soil and vegetation on site;
		  • All vehicles (including trailers) used by projects shall comply with all legal requirements in terms of roadworthiness and licensing and shall display a valid license at all times.
		  • Servicing and maintenance of vehicles on-site shall be avoided as far as possible;
		• Equipment:
		  • Drip trays shall be put in place in relevant locations (inlets, outlets, points of leakage, etc.) so as to prevent spillage or leakage during transfer;
		  • The contractor shall stand any equipment that may leak, and does not have to be transported regularly, on watertight drip trays to catch any pollutants;
		  • The drip trays shall be of a size that the equipment can be placed inside it;
		  • Drip trays shall be cleaned regularly and shall not be allowed to overflow;
		• Substances, which cannot be reused, shall be disposed of according to the relevant waste disposal procedure;
		• A specialist waste contractor shall dispose of any hazardous waste off-site at a licensed hazardous waste disposal site;
		• The contractor shall be responsible for ensuring that any party delivering potentially dangerous chemicals and oil to site is aware of the appropriate storage and drop-off locations and procedures. Transfer of hazardous chemicals and other potentially hazardous substances shall be carried out so as to minimise the potential leakage and prevent spillage onto the soil;
		• The contractor shall keep the necessary materials and equipment on site to deal with spillage of the relevant hazardous substances present on site;
		• Further measures to reduce sediment generated from construction activities include ensuring that soil is not deposited into a watercourse and the re-vegetation of the exposed areas as soon as possible;
		• Refuelling of vehicles shall only take place at a predetermined area, where adequate pollution prevention measures are in place.

ID	Environmental Aspect	Mitigation/Management Measures
4	Groundwater	• Please refer to mitigation/management measures associated with surface water; • All purchased rock shall be from registered and approved crushers. Copies of shall be kept on file by the implementer; • A record must be kept of all spills and the corrective action taken.
5	Biodiversity: Flora	• A sensitivity map has been developed for the study area, indicating areas, which are considered to be of increased ecological importance. It is recommended that this sensitivity map be considered during all development phases to aid in the conservation of floral diversity within the study area; • Clearance of vegetation to be restricted to that required to facilitate the execution of the works; • No stockpiling, dumping or storage of equipment or materials should be allowed within the demarcated sensitive areas; • No movement of vehicular or human traffic should be allowed in any wetlands demarcated to be protected; • Any spillage from vehicles should be cleaned up immediately; • No vegetation to be disposed of by burying or burning without the requisite permit from local authority; • Vegetation clearance will only be conducted within the authorised site footprint (including that area required for the construction activities) and disturbance will be minimized as far as feasible; • Prohibit use of herbicides or pesticides within 100 m of any wetland and other water resources.
6	Biodiversity: Fauna	• A sensitivity map has been developed for the study area, indicating areas, which are considered to be of increased ecological importance. It is recommended that this sensitivity map be considered during all development phases to aid in the conservation of floral diversity within the study area; • All development footprint areas and areas affected by the proposed development should remain as small as possible and should not encroach unnecessarily into the surrounding sensitive areas and the associated buffer zones; • Informal fires in the vicinity of FAD 6 Project should be prohibited throughout the life of the project; • During induction of all personnel and contractors, awareness training in terms of Faunal species is recommended to increase awareness, respect and responsibility towards the environment; • It is recommended that a low speed limit is implemented on all roads running through the project area in order to minimise risk to faunal species from vehicles; • No trapping or hunting of fauna is to take place; • It must be ensured that migratory connectivity between sensitive areas is maintained where possible.
7	Soils, Land Use and Land Capability	• Top soil must be stripped within working areas; • Topsoil must be stored separately from subsoil and used for subsequent rehabilitation and revegetation; • Topsoil stockpiles shall not be compacted; • All cleared vegetation shall either be mulched and mixed into the topsoil stockpiles or disposed of at an approved disposal site; • A record must be kept of all spills and the corrective action taken; • All contractor vehicles shall be stored in a location where an oil trap shall be installed to prevent soil pollution or will be stored with a drip tray underneath them; • Cleared areas shall be stabilised as soon as possible; • All impacted areas outside of the footprints of the facilities shall be rehabilitated (loosen soil and re-vegetate) once work has been completed and prior to the construction team leaving the site. These activities shall include the closure and rehabilitation of temporary access; • The implementation of adequate stormwater controls to reduce water velocity will mitigate erosion.

7.2 Infrastructure Specific Environmental Management Programme

In addition to the management measures listed in Table 7-1, Table 7-2 summarises the infrastructure specific[26] management measures to be implemented to further reduce the risk on water resources associated with the infrastructure/activities.

Table 7-2: Infrastructure Specific Management Measures

Infrastructure	Management Measure
Trenched Electrical Cables	• All works will be confined to the existing service corridor and road infrastructure and there will be no encroachment into adjacent areas of semi-natural habitat; • Existing roads and tracks are to be utilised as much as possible, reducing the impact to soils from compaction and plant spillages/leaks; • Construction works will be carried out with the least possible disturbance of soils outside the extent required for the works; • Riparian/buffer zones to be maintained and only allowing permitted access; • Provide adequate drainage and capacity (stormwater management), with cleaning and maintenance where necessary; • Ensure that concrete does not enter watercourses; • No trees shall be cut during the execution of the contract unless specifically arranged with the engineer. Should any trees have to be removed, the contractor shall arrange for the complete uprooting and trimming of tree trunks, as well as the stacking of all trunks and branches. Holes caused by the uprooting shall be filled and consolidated; • It is preferred that trenches not be left open overnight to minimise the length of time of impacts and to minimise the possibility of the trench sides becoming unstable. If it is unavoidable, however, the contractor must, as a minimum, install orange trench barrier netting. The netting must be a bright orange colour, a minimum of 1.2 m high and supported every 2 m by a wooden or iron pole of 1.5 m to prevent injury to passers-by; • In areas where the open excavation is not very well lit, the contractor may, in addition to the netting, make use of red strobe lights positioned in intervals of 5 m; • Security patrols are to be provided after working hours for the time that the cables are in the trenches and not backfilled; • All trenches shall be bedded with a 150 mm layer of Fine River sand and after the cables are installed, it shall be covered with another 150 mm layer of sand. After the sand topping it shall be levelled and fitted with concrete tiles 450 x 450 x 25. The entire trench shall be covered; • Only sandy clay or loam soil with a satisfactory thermal resistivity (not exceeding 1.2C m/W) may be used for this purpose. Sea or river sand, ash, chalk, peat clinkers or clayey soil shall not be used.

[26] The risk ratings associated with the trenched electrical cables (D) were amended manually after the implementation of additional mitigation measures (highlighted in red) from a risk rating of MODERATE to LOW.

7.3 Rehabilitation Plan

The rehabilitation plan to address post-construction rehabilitation and closure with the objective of facilitating water resource protection is presented in Table 7-3.

Table 7-3: Rehabilitation Plan for the Proposed FAD 6 Project Infrastructure

Aspect	Rehabilitation Measure
General Study Site	• Minimise the area of clearing to the minimum area safe for construction and operation; • Ensure the removal/control of residual hazardous materials; • Ensure ongoing rehabilitation of all contaminated and/or degraded land as soon as a disturbing activity has ceased or as soon as a component (aspect), no longer required for the FAD 6 Project, is removed; • Ensure the rehabilitation of all disturbed land, as far as practical, to its natural state or predetermined and agreed standards or land uses that conform to the concept of sustainable development; • Implement and monitor all required rehabilitation phases (depending on the degree of degradation to the land) including demolition (progressive and at final closure), remediation (land, surface water and groundwater), improving the condition of these media through soil replacement and revegetation; • Ensure mitigation of residual impacts, including ensuring the long-term stability and safety of the entire project footprint, as well as its capacity to withstand long-term wind and water erosion; • Where infrastructure can be decommissioned and the footprint can be rehabilitated the post-closure land use will be wilderness.
Soils and Land Capability	• Where possible and practical, backfill all unsafe trenches and holes as far as practicable to ensure that no slopes exceed a gradient of 1:3; • Ensure soil stripping and stockpiling (top and subsoil separated where possible) conserves and maintains integrity of the topsoil; • All soils compacted as a result of the pre-construction activities falling outside the infrastructure footprint areas should be ripped and profiled; • During construction, the necessary and appropriate erosion control measures will be implemented at erodible areas to minimise erosion; • If soil becomes degraded, improve soil fertility through addition of ameliorants to create a sufficient growth medium for rehabilitation; • Footprints to be ploughed parallel to the contours after soils and ameliorants have been placed to mitigate compaction, which may have occurred during soil placement.
Riparian Areas	• All project affected riparian features should be visually inspected and monitored for erosion and incision; • Ongoing biomonitoring in the vicinity of the study area must take place.