
**APPENDIX F: IMPACT ASSESSMENT FOR THE DEVELOPMENT OF THE NEOPAK CHP PLANT,
ROSSLYN, GAUTENG**

TABLE OF CONTENTS:	PAGE
INTRODUCTION	2
SECTION A: POTENTIAL IMPACTS ASSOCIATED WITH THE DEVELOPMENT OF THE NEOPAK CHP PLANT.....	7
IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE.....	7
IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION, OPERATION AND DECOMMISSIONING PHASES	7
1. Construction Phase	7
2. Operation Phase	11
3. Decommissioning Phase	15
4. Conclusion	16
5. No-Go Alternative	17
SECTION B: ASSESSMENT OF CUMULATIVE IMPACTS	18
SECTION C: OVERALL CONCLUSIONS.....	19

INTRODUCTION

Neopak (Pty) Ltd propose to develop a Combined Heat and Power (CHP) gas turbine at the existing Neopak Facility in Rosslyn, Gauteng. The project is known as the Neopak CHP Plant. The existing Neopak paper mill facility in Rosslyn is located on a site located within Portion 3 of Erf 39, Portion 1 of Erf 41 and Erf 40 (the affected properties)¹. The development area² proposed for the CHP Plant is located within the existing Neopak paper mill facility (project site)³, and is the area within which the construction and operation of the CHP Plant will take place. These properties are considered to be a brownfields site⁴ which has been transformed through industrial development (refer to **Figure 1** and **Table 1** for more detail). A development footprint⁵ of approximately 675m² has been identified within the existing Neopak facility and the development area for the construction and operation of the CHP Plant. The general area is of an industrial nature, as Rosslyn is an industrialised area and includes industries such as the BMW factory and the Nissan South Africa factory.

Table 1: Location of the Neopak CHP Plant project site, within the existing Neopak Paper Mill

Province	Gauteng Province
Municipality	City of Tshwane Metropolitan Municipality
Ward number(s)	98
Nearest town(s)	The project site is located within Rosslyn which is an industrial area within Pretoria. The project site is located ~23km north of the Pretoria Central Business District.
Farm name(s) and number(s)	Surveyor-General Database » Portion 3 of Erf 39 » Portion 1 of Erf 41 » Erf 40 City of Tshwane City Planning and Development Department » Parcel 514 Rosslyn, 6953 Hendrik van Eck Street
SG 21 Digit Code	Surveyor-General Database » T0JR02220000003900003 » T0JR02220000004100001 » T0JR02220000004000000

¹The affected properties of the Neopak Facility (i.e. Portion 3 of Erf 39, Portion 1 of Erf 41 and Erf 40) was sourced from the Surveyor-General Database. However, the affected properties are also known as Parcel 514 Rosslyn, 6953 Hendrik van Eck Street as per the City of Tshwane City Planning and Development Department.

² The development area is the identified location within the project site within which the CHP Plant will be sited. The development area will include the development footprint, which will house the CHP turbine as well as the associated linear infrastructure including gas lines and cabling. The development area is approximately 1.3ha in extent.

³ The project site is defined the existing Neopak paper mill facility located in Rosslyn, Gauteng. The project site includes three affected properties namely Portion 3 of Erf 39, Portion 1 of Erf 41 and Erf 40.

⁴ A brownfields site can be described as land previously or currently developed and used for industrial purposes or commercial purposes. Such land is considered to be transformed, and degraded to an extent that the natural environmental attributes are considered to be minimal.

⁵The development footprint is the area identified within the development area to house the CHP Plant. The development footprint is approximately 0.0675ha / 675m² in extent.

The Neopak Facility currently uses natural gas in a gaseous form and coal to generate steam for use in the current paper mill operations. Neopak are now proposing the development of a CHP Plant to pass the same gas through a gas turbine to generate both steam and electricity. This development will be aiding and adding to the production of steam which is currently being produced by coal and gas fired boilers on-site and also generate electricity. The purpose of the project is, therefore, to produce both power and steam, rather than just steam which is currently being produced by existing boilers located within the plant:

1. The steam produced by the CHP plant will be used for the operations of the paper mill facility,
2. The electricity produced will be evacuated via an 11kV cable to an existing substation located within the Neopak Facility.

The development will provide the opportunity for a more efficient use of the available energy, effectively delivering a proportion of "free" conversion to electricity generation. The basic operation of the proposed CHP Plant includes the following:

- » Inlet air is filtered and ducted into multiple compression stages.
- » Natural gas is fed into the combustion chamber, mixed with the compressed air and then combusted.
- » The combustion exhaust drives a series of turbine blades to provide rotational force to the drive shaft.
- » Electricity is produced through a generator connected to the drive shaft, which generates the power component of the plant.
- » Hot gases exiting the turbine at 500°C, contain a high level of energy and are ducted to a heat recovery steam generator which generates the steam component of the plant.
- » Final products of the combustion is exhausted to the atmosphere via flue.

Potential impacts associated with the development of the CHP Plant are discussed in Section A and Section B below. The findings of the impact assessment indicate that all impacts are limited and of a low significance due to the location of the CHP Plant within the existing Neopak Facility located within the Rosslyn industrial area. The industrial area has undergone whole-scale transformation which includes built infrastructure and linear infrastructure (i.e. roads, power lines and railway lines). No natural features occur within the site or the existing Neopak facility due to the transformed state of the area which has been levelled and surfaced throughout.

In order to specifically assess the impact of the development of the CHP Plant on the atmospheric quality of the project site located within the existing Neopak facility an Atmospheric Impact Assessment has been undertaken as part of the Basic Assessment Process (refer to **Appendix D1**).

The following methodology was used in assessing impacts related to the proposed development. All impacts are assessed according to the following criteria:

- » The **nature**, a description of what causes the effect, what will be affected, and how it will be affected.
- » The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of

- between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high).
- » The **duration**, wherein it is indicated whether:
 - * The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
 - * The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
 - * Medium-term (5–15 years) – assigned a score of 3;
 - * Long term (> 15 years) - assigned a score of 4; or;
 - * Permanent - assigned a score of 5.
 - » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
 - * 0 is small and will have no effect on the environment;
 - * 2 is minor and will not result in an impact on processes;
 - * 4 is low and will cause a slight impact on processes;
 - * 6 is moderate and will result in processes continuing but in a modified way;
 - * 8 is high (processes are altered to the extent that they temporarily cease); and
 - * 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
 - » The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
 - * Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
 - * Assigned a score of 2 is improbable (some possibility, but low likelihood);
 - * Assigned a score of 3 is probable (distinct possibility);
 - * Assigned a score of 4 is highly probable (most likely); and
 - * Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
 - * The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
 - * The **status**, which is described as positive, negative or neutral.
 - * The degree to which the impact can be reversed.
 - * The degree to which the impact may cause irreplaceable loss of resources.
 - * The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

$S = (E+D+M) P$; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance** weightings for each potential impact are as follows:

- * < **30 points**: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

- * **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- * **> 60 points: High** (i.e. where the impact must have an influence on the decision process to develop in the area)

The sections below provide an impact assessment of the CHP Plant as follows:

- » Section A: Impacts associated with the Neopak CHP Plant construction, operation and decommissioning phases
- » Section B: Assessment of Cumulative Impacts
- » Section C: Overall Conclusions

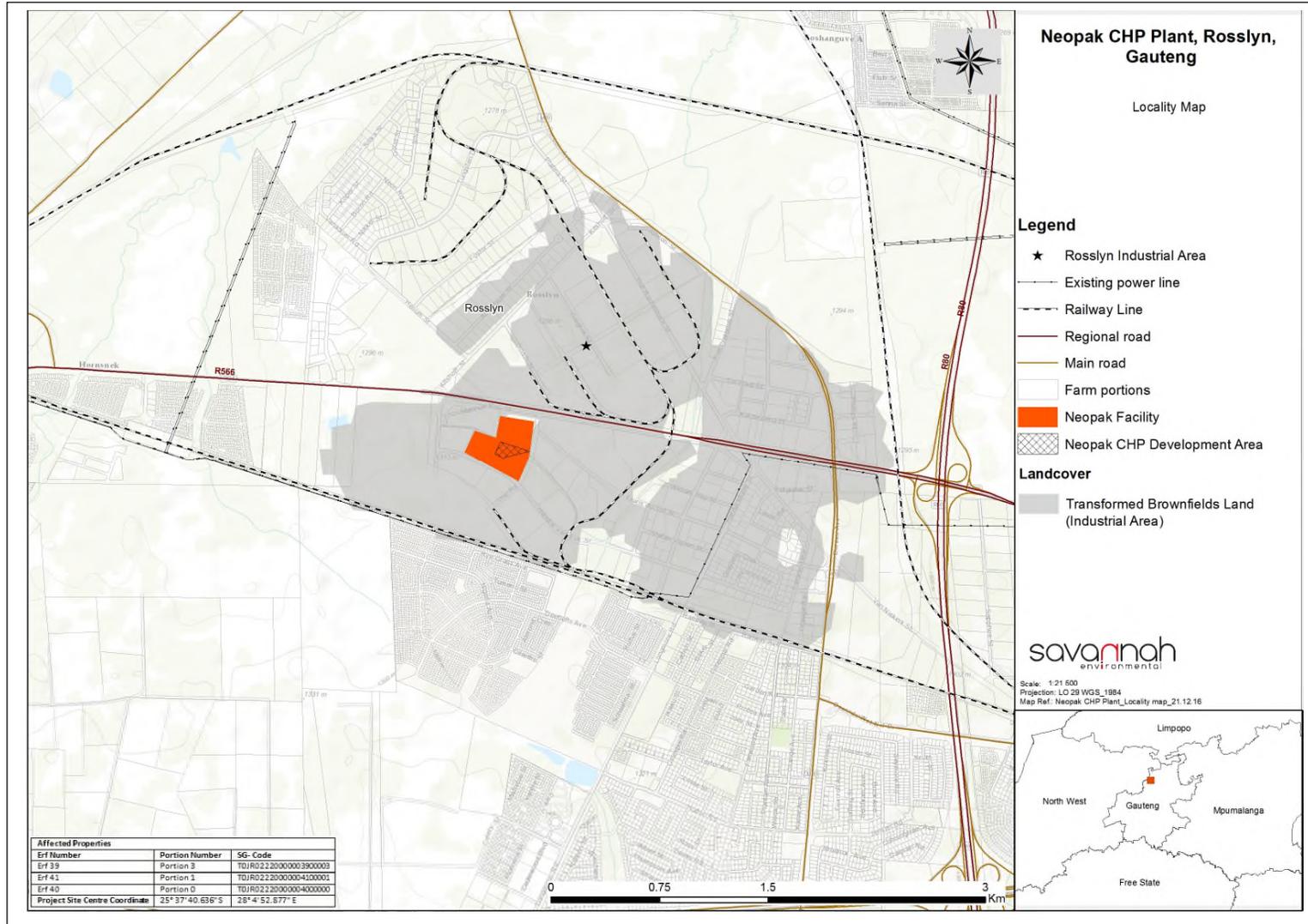


Figure 1: Locality Map of the CHP Plant located within the existing Neopak Facility, Rosslyn, Gauteng.

SECTION A: POTENTIAL IMPACTS ASSOCIATED WITH THE DEVELOPMENT OF THE NEOPAK CHP PLANT

This section provides a description and an assessment of the identified impacts associated with the development of the Neopak CHP Plant during the construction, operation and decommissioning phases.

IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

No impacts are anticipated to result from the planning and design phase of the development due to the nature and location of the Plant. Activities associated with the design and pre-construction phase pertains mostly to planning of the construction period to ensure that no issues are raised during the construction phase which relates to the construction activities and that the phase is completed timeously.

IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION, OPERATION AND DECOMMISSIONING PHASES

1. Construction Phase

The construction phase will be 6 months. The construction phase will include the transportation of the required equipment and building material to the Neopak Facility. No excavation of any natural habitats or vegetation will be required for the construction phase due to the already transformed nature of the site within an industrial area. The installation of the CHP Plant will include the connection of the CHP Plant to the existing gas lines which service the site, the installation of the CHP Plant in the existing Neopak Facility and the laydown of the 11kV cable (within an already transformed area) for the evacuation of the generated electricity to the existing substation located within the Neopak Facility boundary and approximately 140m west of the proposed CHP Plant.

Up to 75 employment opportunities will be created during the construction phase of the CHP Plant.

Construction related impacts have been identified and are assessed below, before and after mitigation for the project.

Nuisance impacts including dust and noise during the construction phase of the CHP Plant.

The construction will include activities such as demolition of existing infrastructure, general building, cutting and welding. These activities will create nuisance through the generation of dust, noise and visual intrusion.

Nature: Limited dust and noise will be generated by the construction activities for the installation of the CHP Plant. There will not be a significant impact to surrounding areas due to the industrialised nature of the area and the installation of the CHP plant within the existing Neopak facility. The impact can be considered as negligible.

	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short Term (1)	Short Term (1)
Magnitude	Minor (2)	Small (0)
Probability	Probable (3)	Improbable (2)
Significance	Low (12)	Low (4)
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:	Dust impacts must be mitigated through the implementation of appropriate dust suppression, as required.	
Cumulative impacts:	The cumulative impact will be low due to the limited nature and extent of the development within an already industrialised area.	
Residual impacts:	None	

Nuisance impacts associated with the development of the CHP Plant will be negative, local in extent and short term. The magnitude of the impact will be small and is improbable. The overall significance is therefore low (and can be reduced further by implementing the recommended mitigation measures).

Generation of construction waste

During the construction phase limited construction waste will be generated. The construction waste will mainly include mechanical material and packaging and would be disposed of at acceptable and licensed facilities, in line with current industrial waste disposal practises being practised by the Neopak Facility.

Nature: Limited waste will be generated during the construction phase. All waste generated during the construction phase is required to be disposed of in an appropriate manner.		
	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Short Term (1)	Short Term (1)
Magnitude	Small (0)	Small (0)
Probability	Probable (3)	Improbable (1)
Significance	Low (6)	Low (2)
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation	All construction waste is disposed of at a licensed facility and the disposal is supported with a waste manifest.	
Cumulative Impacts	None	
Residual Impacts	None	

Impacts associated with the generation of construction waste will be negative, local in extent and short term. The magnitude of the impact will be small and is improbable to occur. The overall significance is therefore low (and can be reduced further by implementing the recommended mitigation measures).

Impact on traffic resulting from transportation of the equipment required for the construction of the facility to the site

The construction of the CHP Plant will require the transportation of the required project components and equipment to the site. Due to the nature and extent of the CHP plant, as well as its planned location within an industrial area which has an adequate road network, the impact on traffic will be negligible.

Nature: Equipment and project components will be transported to site during the six-month construction period. The site for the CHP Plant is located within the Rosslyn industrial area which has an adequate road network to provide for the movement of light and heavy vehicles in the area, and can readily accommodate abnormal loads.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short Term (1)	Short Term (1)
Magnitude	Minor (2)	Small (0)
Probability	Probable (3)	Probable (3)
Significance	Low (12)	Low (6)
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:	<ul style="list-style-type: none"> » All vehicles must be road-worthy and all drivers must have a valid license. » If abnormal loads will be transported to site the relevant permits or clearances must be in place. » Transporting of goods through the use of abnormal loads need to take place during off-peak hours. 	
Cumulative impacts:	Cumulative impacts will be minimal due to the short construction period (6-months) for the CHP Plant	
Residual impacts:	None	

Traffic impacts associated with the construction phase will be negative, local in extent and short term. The magnitude of the impact will be small and probable to occur. The overall significance is therefore low (and can be reduced further by implementing the recommended mitigation measures).

Employment opportunities during the construction phase

The construction phase of the CHP Plant will require up to 75 employees specifically the construction and installation of the CHP Plant. The employment opportunities will also allow for a transfer of skills.

Nature: The construction phase will create up to 75 employment opportunities. Skills transfer will occur as the employees will be trained in the construction of power generation technology utilising gas.		
	Without Enhancement	With Enhancement
Extent	Local (1)	Local (1)
Duration	Short Term (1)	Short Term (1)
Magnitude	Small (0)	Low (4)
Probability	Definite (5)	Definite (4)

Significance	Low (10)	Low (24)
Status	Positive	Positive
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be enhanced?	Yes	
Enhancement:	The allocation of employment opportunities should be undertaken on a fair basis.	
Cumulative benefit:	None	
Residual benefit:	Economic growth in the community	

Employment opportunities during the construction phase will have a positive benefit, will be local in extent and short term. The magnitude of the impact will be low and will definitely occur. The overall significance of the benefit is considered to be low.

PM10 emissions from construction activities

Construction activities will lead to the emission of particulate matter (PM10) as a result of welding and cutting of existing infrastructure and the installation of the required CHP infrastructure.

Nature: The construction will include activities will lead to the emission of particulate matter (PM10) which may impact any affected parties. Emissions of air pollutants will be very low and the associated ambient concentrations will also be very low and limited to the site.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short Term (1)	Short Term (1)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (8)	Low (8)
Status	Negative	Positive
Reversibility	Yes (when construction ends)	Yes (when construction ends)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated or enhanced?	Yes	
Mitigation/Enhancement:	<ul style="list-style-type: none"> » Cover loads on vehicles carrying dusty construction materials » Limit access to construction site to construction vehicles only 	
Cumulative impacts:	Particulate matter emissions from construction will increase the ambient concentrations, but it is unlikely that the cumulative effect will result in exceedances of the NAAQS.	
Residual impacts:	There are no residual impacts associated with construction. The impact will cease when the construction stops.	

Emissions of air pollutants will be very low and the associated ambient concentrations will also be very low and limited to the extent of the site. Despite this, the nature of the potential impact is negative. The extent of potential impacts for the unmitigated case is predicted to be limited to the construction site/development footprint. The construction activities will be short-term.

The magnitude of the impact associated with the construction activity is considered to be low. Considering the limited extent of the potential impact, the short duration, and the implementation of dust control measures, it is improbable that the NAAQS will be exceeded at

the site, and beyond the fence line. The impact magnitude is therefore minor. The significance of the impact for both the unmitigated and mitigated cases is therefore low.

2. Operation Phase

The operation phase will be ~20 years in duration. The operation phase will include the generation of steam and electricity through the use of natural gas (which is already available on the site and already used for the Neopak Facility operating processes). The CHP Plant will require maintenance as and when required, which will be determined through the performance of the plant.

The nature of the impact of the development of the CHP Plant on ambient air quality during the operation phase is largely dependent on emissions from the operation phase of the CHP Plant associated with the combustion of natural gas in a gaseous form. Natural gas produces fewer emissions than oil and coal and CHP systems capture and utilise heat that would otherwise be wasted from the production of electricity. While there will be an increase in concentrations of both CO and NOx, the impacts on ambient air quality are minimal relative to the NAAQS. The release of the expected emissions, including carbon monoxide, nitrogen dioxide, sulphur dioxide and particulate matter, will not reach any set limit as per the National Ambient Air Quality Standards (NAAQS) and is therefore considered to be compliant with the standards.

The operation phase is not anticipated to create additional full time employment opportunities as the Neopak Facility already employs a significant number of staff who have the required skill for the operation of the CHP Plant.

Operation phase related impacts have been identified and are assessed below, before and after mitigation for the project.

Maximisation and optimisation of natural gas as an energy resource

The operation of the CHP Plant will ensure the optimisation and efficiency of the use of natural gas in a gaseous form as an energy resource through the generation of both steam and electricity. Natural gas produces fewer emissions than oil and coal and CHP systems capture and utilise heat that would otherwise be wasted from the production of electricity. This method ensures that no energy goes to waste through the combustion of the natural gas.

Nature: The CHP Plant will utilise natural gas (readily available at the Neopak Facility) for the generation of both steam and electricity. Both the steam and electricity will be utilised for the processes of the Neopak Facility. This will reduce the dependence of coal as an energy source for Neopak.		
	Without Enhancement	With Enhancement
Extent	Local (1)	Local (1)
Duration	Long Term (4)	Long Term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Medium (33)
Status	Positive	Positive

Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be enhanced?	Yes	
Enhancement:	Maintenance on the CHP Plant should be carried out regularly to ensure the efficient operation of the plant and the efficient use of the natural gas as an energy resource.	
Cumulative impacts:	Better use of natural gas in a gaseous form as an energy resource without the loss of energy through the combustion of the natural gas	
Residual impacts:	None	

The maximisation and optimisation of natural gas as an energy resource through the operation of the CHP Plant will be a positive impact, local in extent and long term. The magnitude of the impact will be minor and is improbable. The overall significance is therefore low (subject to the implementation of the recommended mitigation measures).

Natural Gas Combustion associated with the CHP Turbine and the release of CO

The operation of the CHP Plant will include the combustion of natural gas which will lead to the emission of CO.

Nature: The nature of the impact on ambient air quality is largely dependent on emissions from the operation phase of the CHP Plant associated with the combustion of natural gas. Natural gas produces fewer emissions than oil and coal and CHP systems capture and utilise heat that would otherwise be wasted from the production of electricity. While there will be an increase in concentrations of both CO and NOx, the impacts on ambient air quality are minimal relative to the NAAQS.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long Term (4)	Long Term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (21)
Status	Negative	Negative
Reversibility	Yes (when the operation ceases)	Yes (when the operation ceases)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated / enhanced?	Yes	
Mitigation:	Operate under optimal conditions and carry out regular maintenance	
Cumulative impacts:	There are limited sources of CO in the vicinity of the site, the potential for cumulative impact is therefore low.	
Residual impacts:	There are no residual impacts associated with operations. The impact will cease when the operation stops.	

The emission of CO through the combustion of natural gas will be a negative impact, local in extent and long term. The magnitude of the impact will be minor and is probable to occur. The overall significance is therefore low (and remains low with the implementation of the recommended mitigation measures).

Natural gas Combustion associated with the CHP Turbine and the release of NOx

The operation of the CHP Plant will include the combustion of natural gas which will lead to the emission of NOx.

Nature: The nature of the impact on ambient air quality is largely dependent on emissions from the operational phase of the CHP System associated with the combustion of natural gas. Natural gas produces fewer emissions than oil and coal and CHP systems capture and utilise heat that would otherwise be wasted from the production of electricity. While there will be an increase in concentrations of both CO and NOx, the impacts on ambient air quality are minimal relative to the NAAQS.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long Term (4)	Long Term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (21)
Status	Negative	Negative
Reversibility	Yes (when the operation ceases)	Yes (when the operation ceases)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated / enhanced?	Yes	
Mitigation:	Operate under optimal conditions and carry out regular maintenance.	
Cumulative impacts:	There are limited sources of NOx in the vicinity of the site, the potential for cumulative impact is therefore low.	
Residual impacts:	There are no residual impacts associated with operations. The impact will cease when the operation stops.	

The emission of NOx through the combustion of natural gas will be a negative impact, local in extent and long term. The magnitude of the impact will be minor and is probable to occur. The overall significance is therefore low (and remains low with the implementation of the recommended mitigation measures).

PM10 emissions from natural gas boilers

The operation of the CHP Plant will include the combustion of natural gas which will lead to the emission of particulate matter (PM10)

Nature: Particulate matter (PM10) is emitted by the existing boilers using natural gas. Emissions are very low and the associated ambient concentrations will also be very low and limited to the site.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long Term (4)	Long Term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (21)
Status	Negative	Negative

Reversibility	Yes (when the operation ceases)	Yes (when the operation ceases)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated / enhanced?	Yes	
Mitigation:	Operate under optimal conditions and carry out regular maintenance	
Cumulative impacts:	There are exceedances of PM10 in Rosslyn, but predicted concentrations from Neopak are very low, the potential for cumulative impact is therefore low.	
Residual impacts:	There are no residual impacts associated with operations. The impact will cease when the operation stops.	

The emission of PM10 through the combustion of natural gas will be a negative impact, local in extent and long term. The magnitude of the impact will be minor and is probable to occur. The overall significance is therefore low (and remains low with the implementation of the recommended mitigation measures).

SO₂ emissions from natural gas boilers

The operation of the CHP Plant will include the combustion of natural gas which will lead to the emission of SO₂.

Nature: SO ₂ is emitted by the existing boilers using natural gas. Emissions are very low and the associated ambient concentrations will also be very low and limited to the site.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long Term (4)	Long Term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (21)
Status	Negative	Negative
Reversibility	Yes (when the operation ceases)	Yes (when the operation ceases)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated / enhanced?	Yes	
Mitigation:	Operate under optimal conditions and carry out regular maintenance	
Cumulative impacts:	The limited sources of SO ₂ in the vicinity of Nepoak and the predicted concentrations from Neopak are very low, the potential for cumulative impact is therefore low.	
Residual impacts:	There are no residual impacts associated with operations. The impact will cease when the operation stops.	

The emission of SO₂ through the combustion of natural gas will be a negative impact, local in extent and long term. The magnitude of the impact will be minor and is probable to occur. The overall significance is therefore low (and remains low with the implementation of the recommended mitigation measures).

Maintenance of the CHP Plant during the operation phase

Maintenance will be undertaken on the CHP Plant on a regular basis to ensure that the plant is operated at an optimal level and to ensure the efficiency of the use of natural gas an energy resource. The CHP Plant is located within the Neopak facility site, which has appropriately sealed and bunded areas, as required.

Nature: Maintenance will include the replacement of oils utilised by the CHP Plant and the replacement of parts. These project components will be required to be disposed of in a responsible manner and at licensed waste disposal facilities.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long Term (4)	Long Term (4)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low (27)	Low (14)
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:	<ul style="list-style-type: none"> » Oils replaced at the plant must be disposed of in an appropriate manner or recycled for re-use. » All old-parts replaced at the CHP Plant needs to be disposed of at an appropriate disposal site or recycled. 	
Cumulative impacts:	None	
Residual impacts:	None	

Maintenance of the CHP Plant will require the replacement of oils and parts and will be negative, local in extent and long term. The magnitude of the impact will be minor and is improbable. The overall significance is therefore low (and can be reduced further by implementing the recommended mitigation measures).

3. Decommissioning Phase

The impacts during the decommissioning and closure phases will be similar to impacts of the construction phase (including cutting and general demolition works) as discussed in this assessment. The decommissioning phase is likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

In addition, the social impacts associated with final decommissioning are likely to be limited due to the relatively small number of permanent employees affected.

The potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of appropriate mitigation measures. With mitigation, the impacts are assessed to be low (negative).

PM10 emissions from closure activities

Nature: The decommissioning will include cutting and general demolition. Emissions of particulates will be very low and the associated ambient concentrations will also be very low and limited to the site.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Short Term (1)	Short Term (1)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (8)	Low (8)
Status	Negative	Negative
Reversibility	Yes (when decommissioning ends)	Yes (when decommissioning ends)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated / enhanced?	Yes	
Mitigation:	<ul style="list-style-type: none"> » Cover loads on vehicles carrying dusty construction materials » Limit access to site to construction vehicles only 	
Cumulative impacts:	PM10 emissions from decommissioning will increase the ambient concentrations, but it is unlikely that the cumulative effect will result in exceedances of the NAAQS.	
Residual impacts:	There are no residual impacts associated with construction. The impact will cease when decommissioning stops.	

Emissions of air pollutants will be very low and the associated ambient concentrations will also be very low as a result and limited to the site. Despite this, the nature of the potential impacts associated with construction are negative due to the risks associated with exposure to air pollutants. The extent of potential impacts for the unmitigated case is predicted to be limited to the site. The decommissioning activities should take place over a limited number of months so the duration of the potential impact is short-term.

Considering the limited extent of the potential impact, the short duration, the unlikelihood of exceedances of the NAAQS and the implementation of dust control measures, the magnitude of the impact associated with the decommissioning activities is considered to be low. The significance of the impact for both the unmitigated and mitigated cases is therefore low.

Dust control measures during decommissioning will ensure that the significance of the potential impacts remain low.

4. Conclusion

Overall the impact of the CHP Plant will be of **low to negligible significance** due to the already heavily transformed nature of the site through the development of the existing Neopak Paper Mill Facility. No natural features or habitats will be destructed during the life cycle of the facility.

Impacts associated with the construction phase (~6 months) will be negligible due to the transformed nature of the site and the presence of the existing Neopak facility infrastructure. The impacts associated with the operation phase (~20 years) will be the most prominent as disturbance will take place within the paved (sealed)/transformed area, however only limited

due to the nature of the surrounding industrial area and the nature of the operational CHP Plant. The impacts of the construction phase and operation phase have been assessed as being of a low significance, both before and after the implementation of the recommended mitigation measures.

With the implementation of appropriate mitigation measures the development of the CHP Plant is considered to be appropriate, with negligible impacts on all activities and without any fatal flaws.

5. No-Go Alternative

The no-go (or do nothing) alternative will result in the continuation of the use of the current boilers at the Neopak Facility to raise steam, which operate on both gas and coal. The heat generated by the current boilers is wasted, and not used as an energy source to generate electricity. The best practicable environmental solution is to introduce a technology to the plant which can utilise heat that would otherwise be wasted.

As the current boilers are only able to raise steam, this no-go alternative is undesirable as the Neopak Facility will still be reliant on coal as an energy resource. In addition, electrical energy potential from the boilers will still be wasted and no benefit arising from this energy. The no-go alternative for the development of the CHP Plant is not considered as the desirable or feasible alternative due to the following reasons:

- a. The existing Neopak facility has natural gas in gaseous form readily available for use. A new source of gas is, therefore, not required.
- b. The development of the CHP Plant will ensure the efficient use of the natural gas through the generation of both steam and electricity which are considered as essential requirements for the operation of the paper mill.
- c. The development of the CHP Plant ensures that all more of the energy released through the combustion of natural gas in gaseous form is utilised for the operating process and that a much smaller percentage (from c.30% to c.10% losses) of energy is lost, optimising the use of the energy resource.
- d. The generated electricity will reduce the dependence of the Neopak facility on the national grid as well as strengthen the grid supply due to a reduced supply pressure on the grid.

The opportunities presented by the development will be lost if the no-go alternative is applied, and is therefore not considered desirable for the project. The negative impacts of the no-go alternative are considered to outweigh the positive impacts of this alternative.

The 'No-Go' alternative is an undesirable option for the project as it will result in a lost opportunity for sufficient energy utilisation at the existing Neopak facility. **The 'No-Go' alternative is, therefore, not a preferred alternative.**

SECTION B: ASSESSMENT OF CUMULATIVE IMPACTS

The section assesses the cumulative impacts associated with the development of the CHP Plant.

This Basic Assessment includes an assessment of the cumulative impacts associated with the CHP Plant which will generate both steam and electricity for the existing Neopak Facility in Rosslyn, Gauteng.

Cumulative impacts, in relation to an activity, refer to the impact of an activity that in-itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited to effects that can be evaluated meaningfully (DEAT, 2004). Boundaries must be set so analysts are not attempted to measure effects on everything. Therefore, the cumulative impacts associated with the CHP Plant have been viewed from two perspectives within this report:

- » Cumulative impacts associated with the location and nature of the project i.e. a CHP Plant located within the existing operational Neopak Facility in Rosslyn, Gauteng;
- » Cumulative impacts associated with other existing developments within the industrial area surrounding the CHP Plant site.

The site is located within an industrial area, and in an area dominated by industrial facilities. The existing Neopak Facility is an industrial development (i.e. paper mill) and the location of the CHP Plant within the paper mill is characterised by paved surfaces, buildings and heavy infrastructure. The development of the CHP Plant will not lead to a whole-scale change of the area due to the current state of the Rosslyn Industrial Area and the Neopak Facility. The development will also not significantly add to the current impacts of the paper mill. Therefore, the development of the CHP is considered appropriate within the proposed location without any significant cumulative impacts. The cumulative impact is considered to be of **low significance**.

The cumulative impacts expected outside of the boundaries of the Neopak Facility will be of **very low significance**. The area is characterised by heavy industrial development with little natural area remaining. The development of the CHP Plant in consideration with other industrial developments outside of the Neopak Facility boundaries will not significantly add to the industrial nature due to the size of the development area (i.e. ~1.3ha) and the development footprint (~0.0675ha / 675m²) within the larger industrial area.

Overall, the cumulative impacts will not lead to a whole-scale change of the already industrial environment and will not contribute significantly to existing impacts. The cumulative impacts both within and outside of the boundaries of the existing Neopak Facility will be of **low significance**. Therefore, the development is considered appropriate and acceptable within the proposed location.

SECTION C: OVERALL CONCLUSIONS

From the assessment the preferred development footprint for CHP Plant within the Neopak Facility is considered to be acceptable from an environmental perspective. Based on the findings, in terms of environmental constraints and opportunities identified through the Environmental Basic Assessment process, no environmental fatal flaws were identified to be associated with the construction and operation of the Plant.

Impacts are expected to be **low** both before and after the implementation of the mitigation and monitoring measures (which would allow for the minimisation and management of any potential environmental impacts associated with the development). These measures have been incorporated into the EMPr for the project, which will be further developed during the detailed planning and design phase of the project. It is, therefore, recommended that the development can be implemented within the existing Neopak Facility within the identified site development footprint. With reference to the information available at this planning approval stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as high.

Therefore, the Environmental Assessment Practitioner concludes that the establishment of the Neopak CHP Plant within the existing Neopak Facility is considered acceptable from an environmental perspective. It can be concluded that the CHP Plant should be authorised, provided that the recommended mitigation measures are implemented.