

# DRAFT EIA REPORT

## IKAMVA LETHU AGRICULTURAL DEVELOPMENT ON THE REMAINDER OF FARM 653, SUNLAND, SUNDAYS RIVER VALLEY MUNICIPALITY

(DEDEAT REFERENCE: EC/06/C/LN2/M/11-2018)

AUGUST 2018



**Prepared for:**

Ikamva Lethu Farms (Pty) Ltd  
Private Bag X24  
Addo  
6105

**Prepared by:**

Sandy Wren, Marisa Jacoby and Zandri Grobbelaar  
Public Process Consultants  
PO Box 27688, Greenacres, PE, 6057  
120 Diaz Road, Adcockvale, PE 6001  
Phone: 041 – 374 8426 Fax: 041 - 373 2002  
Email: sandy@publicprocess.co.za



<b>Title:</b>	Draft EIA Report, Ikamva Lethu Agricultural Development on the Remainder of Farm 653, Sunland, Sundays River Valley Municipality (August 2018).
<b>Purpose of this report:</b>	<p>This Draft EIA Report forms part of a series of reports and information documents that are being provided during the Environmental Impact Assessment (EIA) process for the proposed agricultural development for Ikamva Lethu Farms (Pty) Ltd, on the Remainder of Farm 653, Sunland, in the SRVM.</p> <p>As per Appendix 3, Section 2 of GN R326, the objectives of the EIA process are to –</p> <ul style="list-style-type: none"> <li>• Assess how the proposed activity complies with the relevant policy and legislative context;</li> <li>• Describe the need and desirability of the proposed activity, including in the context of the development footprint on the approved site as contemplated in the accepted Scoping Report;</li> <li>• Identify the location of the development footprint within the approved site as contemplated in the accepted Scoping Report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;</li> <li>• Determine the -- <ul style="list-style-type: none"> <li>○ Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and</li> <li>○ Degree to which these impacts - <ul style="list-style-type: none"> <li>▪ Can be reversed;</li> <li>▪ May cause irreplaceable loss of resources, and</li> <li>▪ Can be avoided, managed or mitigated;</li> </ul> </li> </ul> </li> <li>• Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted Scoping Report based on the lowest level of environmental sensitivity identified during the assessment;</li> <li>• Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted Scoping Report through the life of the activity;</li> <li>• Identify suitable measures to avoid, manage or mitigate identified impacts; and</li> <li>• Identify residual risks that need to be managed and monitored.</li> </ul>
<b>Prepared for:</b>	Ikamva Lethu Farms (Pty) Ltd Private Bag X24 Addo 6105
<b>Prepared by:</b>	Public Process Consultants PO Box 27688, Greenacres, 6057 Phone: 041 - 374 8426 Fax: 041 - 373 2002
<b>Authors:</b>	Sandy Wren, Marisa Jacoby and Zandri Grobbelaar
<b>Date:</b>	August 2018
<b>To be cited as:</b>	Wren S, Jacoby M and Grobbelaar Z, August 2018. Draft EIA Report - Ikamva Lethu Agricultural Development on the Remainder of Farm 653, Sunland, Sundays River Valley Municipality.

## EXECUTIVE SUMMARY

### PROJECT BACKGROUND AND OVERVIEW

The applicant, Ikamva Lethu Farms (Pty) Ltd, proposes to establish an agricultural development on the Remainder of Farm 653 (hereafter referred to as 'Farm 653'), which measures ~1163ha in extent. It is proposed that an area of ~650ha be transformed on Farm 653, to establish ~586ha of citrus orchards and install associated infrastructure (~64ha). Associated infrastructure includes, internal roads, access points and associated roads, low-level gabion crossing, laydown areas, windbreaks (if required) and dams. Existing infrastructure on Farm 653 is proposed to be renovated and used for the storage of vehicles, pesticides, herbicides and to provide administrative support to the agricultural development, as well as permanent accommodation for five individuals.

In order to provide irrigation water to the proposed development it is proposed that an existing dam (current capacity ~17 000m<sup>3</sup>) be expanded to a capacity of 45 000m<sup>3</sup> and that three new dams, with a capacity of 45 000m<sup>3</sup> each, be constructed in order to supply the required irrigation water for the proposed development. It is anticipated that the dams will have a footprint on average of ~1.5ha each and the wall heights will be ~4.5m.

In addition, an area of ~5.6ha will be disturbed to accommodate the installation of irrigation pipelines (2 x 450mm diameter) and one single pipe crossing of the Sundays River (1 x 630mm diameter), over a length of ~8km, across the following properties, not located on Farm 653:

- Remainder of Farm 714
- Portion 3 of Farm 558
- Portion 39 of Farm 558
- Portion 6 of Farm 558

The proposed pipelines are also required to be installed in the reserve of a proclaimed public road (MR00470). The farm portions included in this assessment fall within the Sundays River Valley Municipal (SRVM) area and the nearest town is Sunland, which is located ~3.5km northeast of Farm 653. Farm 653 is currently zoned Agriculture 1 and the nearest boundary of the Addo Elephant National Park is located ~9.7km east of Farm 653 and 8.2km east of the proposed pipeline route.

In terms of the NEMA EIA Regulations, 2014 (as amended), published in GN R326, 327, 325 and 324, promulgated under Chapter Five of the National Environmental Management Act (Act 107 of 1998) ("NEMAA"), and published in Government Gazette 40772 on the 7 April 2017, the project requires full Scoping and Environmental Impact Assessment (S&EIA), prior to the commencement of any activities on the site. The applicant appointed Public Process Consultants as the independent Environmental Assessment Practitioner (EAP) to undertake the S&EIA for the project.

### OVERVIEW OF THE EIA PROCESS AND PUBLIC PARTICIPATION

This Draft EIA has been preceded by a comprehensive Scoping Process with the Final Scoping Report (FSR), including the Plan of Study for EIA, being submitted to the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) on the 26 April 2018. On the 20 June 2018 acceptance of the FSR and approval of the Plan of Study for EIA was received from the DEDEAT. This marked the end of the Scoping phase of the EIA process. The project then moved into the EIA phase of the assessment.

The key issues identified during the Scoping process, which have been the subject of separate specialist assessments during the EIA, are outlined below:

- Biophysical (Biological and Physical) site assessment including:
  - Consideration of potential project related impacts on natural vegetation and faunal habitat on the site, as well as along the proposed irrigation pipeline route;
  - Consideration of any potential impacts on the Addo Elephant National Park;
  - An Aquatic Assessment to identify and map wetlands and watercourses on Farm 653, as well as along the proposed irrigation pipeline route;
  - Assign suitable buffers for aquatic resources identified on site and along the proposed irrigation pipeline route;
  - Comment on the potential impact of the proposed development on Aquatic CBAs as identified in the ECBCP; and
  - Determination of suitable buffers associated with meeting biodiversity conservation targets specific to the vegetation types on site, and in line with those targets indicated by the relevant planning frameworks for the area.
- The undertaking of a Heritage Impact Assessment to identify heritage resources, materials and artefacts that occur within the area under assessment and recommendations regarding the conservation thereof.

- The undertaking of a Traffic Impact Assessment to determine the impact of the additional trip generation and the suitability of the access points to ensure safe access and egress from the site.
- The undertaking of a Soil Suitability Assessment in the form of a Reconnaissance Soil Survey, to determine the suitability of the soil for the establishment of citrus orchards, to inform the proposed layout.
- The undertaking of a Visual Impact Assessment to determine any changes in the “sense of place” and visual landscape as a result of the proposed development.
- The undertaking of a Security Risk Assessment to evaluate the potential elevated security risk posed by the proposed development on rhino and exotic game in the area.
- The undertaking of a Roads and Wet Services Report to determine the capacity of existing services on site (water, effluent, stormwater management) and to provide recommendations if upgrades to the existing facilities are required.

The primary objective of EIA phase of the assessment is to present to I&APs and affected Organs of State an overview of the predicted impacts, proposed mitigation measures (both positive and negative), closure outcomes, residual impacts of the activity and management actions required to avoid or mitigate the negative impacts; or enhance the positive impacts of the project. This report is being released for a 40-day I&AP review period to enable the authorities and I&APs to provide input and comment before the report is finalised and submitted to the DEDEAT for their decision-making. A copy of the Draft EIA Report and EMPr can be downloaded from the website [www.publicprocess.co.za](http://www.publicprocess.co.za).

For further details on the EIA Process and Public Participation see Chapter Four of the EIA Report.

### **ECOLOGICAL IMPACTS AND RECOMMENDED MITIGATION**

The key ecological impacts associated with the construction and operational phase of the development are as follows:

- Loss of vegetation due to clearing.
- Loss of Critical Biodiversity Area and Ecological Support Area due to clearing of vegetation on Farm 653, as well as along the proposed pipeline route.
- Loss of floral and faunal species of conservation/ special concern due to vegetation clearing and poaching.
- Fragmentation and destruction of habitat on Farm 653 due to clearing.
- Loss of CBA and ESA buffer areas along the non-perennial watercourse, due to clearing of vegetation for agricultural purposes.
- Loss and disturbance of wetland habitat and riparian systems along the drainage areas on Farm 653 and the Sundays River (pipeline installation), due to vegetation clearing.
- Potential water quality degradation (chemical and sewage pollution) of the Sundays River, during installation of the pipelines as well as changes to local water quality of the wetland habitats and non-perennial watercourse on Farm 653 due to return agricultural run-off.
- Hydrological process impacts of the proposed pipeline across the Sundays River (hydrological processes – flow, volume, aquatic species).
- Potential loss of riparian system along the drainage area and the non-perennial watercourse due to vegetation clearance for the proposed pipelines and access roads as well as potential loss and modification of wetland habitat due to the expansion of the existing irrigation dam.
- Potential sedimentation and erosional impacts on drainage areas and the non-perennial watercourse and associated wetland habitats, as well as potential erosion and sedimentation impacts on wetland habitat along the proposed pipeline route.
- Potential increased water levels/ saturation in the wetland habitats and non-perennial watercourse due to drip irrigation.
- Potential changes to the local water quality of the wetland habitats and the non-perennial watercourse due to return agricultural run-off high in nutrients or insecticides, herbicides / pesticides etc. as well as use of existing septic tanks.

Potential Cumulative Impacts on the N40E catchment as a result of the proposed development include:

- Potential cumulative loss of vegetation due to clearing of vegetation.
- Potential cumulative loss of Critical Biodiversity Area and Ecological Support Area due to clearing of vegetation.
- Potential cumulative loss species of special concern due to clearing of vegetation.
- Cumulative loss of CBA and ESA buffers due to clearing of vegetation in the larger catchments
- Cumulative loss and modification of wetland habitat in the larger catchments
- Cumulative impacts on hydrological process of watercourse and riparian areas in the N40E catchments (flow, water quality, erosion, sedimentation etc.).

All these impacts can be reduced by implementing the mitigation and management recommendations found in Chapters Six and Seven of the EIA Report, as summarized below.

### **Vegetation, Biodiversity Patterns and Processes**

The following recommendations are made with regards to the mitigation and management of impacts on vegetation:

- The biodiversity target areas indicated in Chapter Six should be retained (as per the proposed layout). The final layout proposes to retain additional areas over and above the biodiversity target no-go areas.
- No Bontveld vegetation is proposed to be cleared.
- Remove only the required amount of vegetation for citrus cultivation activities i.e. minimize the extent of bare and exposed soils.
- If windbreaks are to be planted, plant indigenous windbreaks, if possible.
- Rehabilitation of disturbed areas post establishment with indigenous species.
- Plant species of special concern must be transplanted from the disturbance footprint to refuge areas on the site (e.g. remaining intact areas) by suitably qualified individuals.
- Permit applications to the Department of Economic Development, Environmental Affairs and Tourism for the protected species.
- An alien plant control program should be implemented which ensures that all invasive exotic plants (*Opuntia ficus-indica* and *O. aurantiaca*) must be removed from the site and alien plant control must take place on an ongoing basis.
- The Environmental Control Officer to approve development footprints (based on the no-go areas), prior to clearing and to monitor clearing within demarcated areas.

### **Fauna**

It is anticipated that the vegetation on the site, as identified by the vegetation specialist, would provide habitat to several small to medium mammal, reptilian and amphibian species. The site is likely also frequented by a variety of avifaunal species. Approximately 85.5 hectares (7.4%) of the natural vegetation on site has been modified historically. Thus, most of the vegetation on the farm can be described as near-natural or degraded. At the time of the site visit buck, bush pig, zebra, porcupine and domestic livestock were determined to have occurred on the farm. The tenant has since vacated the farm and relocated his game and livestock to the new farm. However, some indigenous, wild faunal species are still anticipated to inhabit the natural areas on the farm. In addition, the wetland habitat associated with the non-perennial watercourse is also expected to provide significant faunal habitat. It is anticipated that most of the faunal species remaining on the farm will in all likelihood move off to undisturbed portions of the site as soon as site preparation commences.

The following provides recommendations for the management of impacts on fauna:

- The mobile fauna which may be occurring on the site are expected to vacate the area that is to be developed once vegetation clearing and other site preparation activities commence and will seek refuge in intact natural or near-natural areas that are not proposed for development.
- Measures must be implemented to ensure that fauna on site are not harmed during site preparation or operational phase activities associated with the development, e.g. environmental induction process for construction personnel and/ or farm workers.
- Before site preparation and vegetation clearing commences, affected areas must be thoroughly searched for fauna that can be relocated. This is to be undertaken by a professional faunal specialist (with the necessary permits) and released into no-go areas or other suitable refuge areas.
- A professional reptile remover needs to be contacted to remove dangerous reptiles when in conflict with the workers. No fauna encountered on site to be intentionally harmed.
- Search and rescue operations before and during the site preparation phase will decrease the impacts considerably.
- By retaining the Bontveld vegetation it is anticipated that the proposed development will have little to no impact on threatened faunal species usually associated with this habitat.

### **Aquatic Features (artificial and natural)**

The field survey concluded that 12 wetland habitats, six ephemeral drainage areas (surface water run-off areas) and one unnamed, non-perennial watercourse or river were recorded on Farm 653. The remaining dams/ wetland habitat within 500m of the farm boundary were not surveyed but digitized based on Aerial and Google Earth imagery.

In addition, two irrigation dams with wetland habitat, were recorded within 32m of the proposed pipeline route and pump station (along the MR00470). A third irrigation dam that also supports wetland habitat was recorded along the vehicle access track,

within 32m from of the proposed pipeline route, north of the R336. Additionally, wetland habitat was recorded along the Sundays River at the proposed pipeline crossing.

The following mitigation and management is recommended to protect the aquatic resources on Farm 653 and associated with the installation of the pipeline:

- Adopt the recommended biodiversity No-Go areas including the 20m buffer around the wetlands and ephemeral drainage areas.
- Adopt the recommended 100m buffer around the non-perennial watercourse.
- Further comment from the Department of Water and Sanitation with regards to requirements of Section 21c and 21i of the National Water Act (36 of 1998).
- Existing access tracks to be used as part of the proposed agricultural development to prevent the establishment of numerous additional watercourse crossings.
- Installation of the pipeline across the Sundays River should take place during the dry season when flows are lowest to avoid high rainfall periods and flood peaks.
- Ensure that the extent of the pipelines' construction footprint is as small and narrow as possible, to reduce the amount of vegetation cleared and bank excavated where the pipeline is installed across the Sundays River. Reducing the 7m wide construction footprint is encouraged. To avoid indiscriminate clearing in the sensitive wetland and riparian habitats, demarcate the extent of the construction footprint (Works Area) using non-perishable poles or other solid material for the duration of the construction work and rehabilitation phase.
- Immediate rehabilitation of disturbed areas on the banks of the Sundays River by indigenous species, equivalent to those removed during the construction period. Topsoil and subsoil to be stored separately and replaced in that order, for rehabilitation purposes.
- Stormwater and erosion control measures should be implemented e.g. the use of bidum / hessian or other suitable materials, erosion berms and/ sediment traps when installing the pipeline across the Sundys River.
- Stormwater should be diverted from the construction footprint to prevent erosion and sedimentation along the banks and into the Sundays River and the banks must be re-shaped to their original form (shape, slope) post construction.
- A low-level gabion crossing to be constructed over the non-perennial water course to facilitate the re-alignment of the access road. The gabion structure road crossing will as far as possible follow the natural contours of the site and will allow the natural flow and seepage of water during and after rain conditions but will limit the transport of sediment.
- In order to reduce surface water run-off from orchard areas, establish stormwater management measures, including trenches (with indigenous grasses, not concrete lined) to encourage increased infiltration.
- Limit vegetation removal during the construction/ establishment phase to the proposed development footprint.
- Fertilizer applications should be used at the right time and at the required rates (i.e. excess fertilization can increase available nitrogen or phosphates entering aquatic features).
- Use of slow release nitrogen fertilizers are encouraged as this can improve nitrogen efficiency and reduce leaching of nitrogen.
- Avoid over irrigation. Drip irrigation is encouraged/ supported (as is the standard practice to reduce loss or over-use of water).
- The use of organic fertilizers and mulching is encouraged, as much as possible.
- Strict use and management of potential sources of chemical pollution (e.g. pesticides, fertilizers, hydrocarbons from vehicles and machinery, etc.) i.e. waste management procedures.
- Chemical pesticides and insecticides used should be the safest and least harmful to the environment. Biodegradable products should be used as far as possible.
- International standards to be complied with.
- Chemicals and hazardous waste storage areas should be in the existing storage buildings (as proposed).
- Hazardous and chemical wastes (includes old containers) should be disposed of at registered landfill sites.
- Implement appropriate measures and soil drainage to prevent increase in the salinity of water table and surface water features i.e. Wit River and tributary etc.
- Mulching, if feasible, to increase retention of soil moisture in-situ/ at tree.
- Minimizing bare and exposed soils and implementing drip irrigation (as proposed/ standard practice).
- Audit reporting by the Environmental Control Officer during establishment of orchards.
- These buffers and mitigation measures should be maintained and monitored by the Applicant/ Farm Manager.

All of the ecological impacts (vegetation, faunal and aquatic) that have been rated as having a potential *Medium to High Negative* impact can be mitigated to *Medium* or *Low Negative* or *Neutral*. For further information on the Ecological Impact Assessment and the Aquatic Impact Assessment see Chapters Six and Seven, respectively of the EIA Report.

### **HERITAGE IMPACTS AND MITIGATION**

The Sundays River Formation outcrop is poorly exposed within the study area, which is capped by well exposed, thick orange-brown sandy soils, hillwash and poorly sorted reworked gravels. Although visibility was obscured by the dense thicket vegetation, scatters of uncapped Middle Stone Age stone-tool artefacts were found in secondary context, within the reworked and downwasted gravels capping the hill tops, drainage lines and vehicle tracks. Some evidence was found for the accumulation of reworked stone tools within the Quaternary sediments covering the underlying sedimentary rocks. The artefacts are mainly represented by large, irregular flakes with faceted striking platforms, chunks and reduced pieces made from quartzite.

Except for a farmstead, assorted farm buildings and the existing dam, no other historically significant structures or archaeological sites were recorded. A small graveyard is located ~750m southeast of the farmstead. The irrigation pipeline footprint is proposed in the reserve of a proclaimed public road (MR00470) on degraded terrain, as well as across four properties. The proposed pipeline route traverses farmland from the canal offtake point at the LSRWUA canal system, the other side of the Sundays River, to the proposed termination point at one of the new dams proposed for construction on Farm 653. The pipeline footprint is underlain at depth by Quaternary Alluvium along the Sundays River floodplain. There are no indications of aboveground prehistoric structures, graves, graveyards or historical structures older than 60 years within the proposed pipeline footprint.

#### ***Impacts and Management of Heritage Resources***

The potential impact by the development on below-ground fossils is considered *negative* and *irreversible*, but localised, and will be limited to the construction phase of the project. Potential palaeontological impact during the construction and operational phase of the development is considered *moderate to slight*, since the proposed citrus development will be restricted to areas where superficial sediments (topsoils, alluvium, hillwash etc.) occur at depth. It is further expected that the Quaternary Alluvium underlying the Sundays River floodplain will largely buffer the impact of excavations into unweathered sedimentary bedrock.

The potential impact on palaeontological resources is assessed as *High Negative* which can be mitigated to a *High Positive* impact. Thus, there are no major palaeontological grounds to halt the proposed development.

There are no indications of aboveground prehistoric structures, open sites or rock art within the survey area. Further, no evidence of historically significant structures older than 60 years were observed at the site or along the pipeline footprint. A historical monument, known as "The Lookout", is located ~90m east of the pipeline route on the northern bank of the Sundays River and will not be impacted on by the development (Oberholster 1972). The survey has yielded a number of stone tools distributed as contextually derived surface scatters at the site. The artefacts could not be associated with intact archaeological open sites. However, isolated to multiple uncapped stone tool scatters (incl. mixed or downwasted assemblages) were widespread. Regarded within the context of cultural landscape, the weathered/ *ex situ* stone tool scatters can be viewed as a clear indication of early human presence on the landscape.

Potential impacts on archaeological material or artefacts is assessed as *Low Negative* which can be mitigated to *Neutral*. Thus, there are no major archaeological grounds to halt the proposed development.

The following actions are recommended:

- The Construction Manager should monitor >1m deep excavations into freshly exposed sedimentary bedrock during the construction phase of the project, in particular the dam construction and expansion.
- The Construction Manager should be informed about the possible type of fossils (shell beds, ammonites) that may be encountered within the sedimentary bedrock.
- If any palaeontological heritage or human remains (or any other concentrations of archaeological heritage material) is identified on site, this must be reported immediately to the ECPHRA (Mr Sello Mokhanya, Tel: 043 745 0888; smokhanya@ecphra.org.za). Ideally the fossil material should be left *in situ* until a palaeontologist / archaeologist has provided input as to how to proceed with regard to mitigation.
- The graveyard must be avoided and protected by a 25m no-go buffer zone.

- Middle Stone Age artefacts may occur as capped assemblages within the Quaternary Alluvial deposits flanking the Sundays River. The Construction Manager should be aware of possible accumulations of undisturbed flaked stones when >1m deep trench excavations are to be conducted into unconsolidated sediments, during the construction and installation of the irrigation pipeline.
- However, the ECO (must be trained) must monitor the clearing of the vegetation and if concentrations of archaeological materials and/or human remains are exposed then all work must stop for an archaeologist to investigate.
- An archaeologist should conduct a walkthrough of the area after the vegetation is cleared to check if any significant sites/materials were exposed. Further recommendations will follow after the investigation.

For further information on the Heritage Impact Assessment see Chapter Ten of the EIA Report.

### TRAFFIC IMPACTS AND RECOMMENDATIONS

The following conclusions can be drawn from the traffic specialist study:

- Access to the new orchard areas can be provided directly from MR470 at the locations indicated (see Chapter Eight) as long as the primary access point is re-aligned so as to be opposite the existing access located north of the road;
- A total of 19 tractor-trailers or 24 interlink trucks generated at full development during harvesting season will have minimal impact on the operational capacity of the adjacent road network;
- The proposed access points are positioned such that sight distances are in excess of the prescribed minimum requirements.

The table below provides a summary of the key direct and indirect impacts associated with the development that have been identified by the traffic specialist. Only impacts that are rated as having a potential *Medium to High or Very High* negative impact are listed below:

ENVIRONMENTAL IMPACT	DEVELOPMENT PHASE	PRE-MITIGATION	POST-MITIGATION
Traffic Safety Impact due to slow moving traffic	Establishment	HIGH	MEDIUM
Traffic Safety Impact due to additional traffic	Operational	HIGH	MEDIUM
Deterioration of Public Road Network	Operational	HIGH	LOW
Generation of Dust	Operational	MEDIUM	MEDIUM POSITIVE

In view of the findings of this study, it is recommended that:

- This TIA be approved by the Eastern Cape Department of Roads and Public Works of the Eastern Cape;
- Access to the proposed development be provided via the existing and proposed access points on MR00470 as indicated in the proposed layout plan, with any cost relating to the access points to be met by the developer;
- The existing primary access point to be re-aligned so that it is positioned opposite to the existing access located north of the road;
- MR00471 and MR00470 to be maintained on a regular basis by the responsible road authorities;
- Suitable warning signage be erected on the approaches to the proposed access points.

For further information on the Traffic Impact Assessment see Chapter Eight of the EIA Report.

### VISUAL IMPACTS AND RECOMMENDATIONS

The area proposed for the Ikamva Lethu agricultural development is in a region that transitions from intensively cultivated farms in the Sundays River Valley to the north and east of the site, to naturally vegetated lands used for game or stock farming south and west of the site. There are areas in the surrounding game farms where some sense of wilderness and remoteness can be experienced, particularly within thicket areas that limit views. *However, where open views are available it is very likely that these views include elements of cultivated land and settlements, and structures associated with that landscape.* It is, therefore, clear that a development, such as proposed for Ikamva Lethu, is not unexpected in the region and that in most cases it will cause low visual intrusion on existing views. Visitors to game farms in the surrounding landscape are likely to be aware of their surrounding environment (i.e. that they are within an intensively cultivated region with large structures, high levels of activity and a relatively high population). *Visual intrusion caused by the proposed development is at most moderate for these receptors – it will be easily recognised but will also partially fit into the landscape.*

Construction activities associated with the pipeline are unlikely to cause much visual intrusion on existing views since the activities will be familiar in a region, where irrigation is a major aspect of the landscape, and views are limited by high trees and buildings. The construction phase of the development will be phased over 7-years, which is a relatively long time for



construction activities and as such it is recommended that owners of neighbouring game farms (i.e. those with high visual exposure areas in the viewsheds) be informed in advance of each phase so that they can adjust their operations to avoid as much of the impact as they can. Construction activities will potentially cause *low significance visual impact* as a result of the proposed development, as well as along the proposed pipeline route, if mitigation measures are successfully implemented. The overall *significance of the landscape impact is very low*, since the landscape of the area will accommodate the proposed development without changing the landscape character type. The *visual impact of the proposed development will have low significance*, since there are very few highly sensitive visual receptors that will be affected and the consequence of the impact on them is rated as *medium*.

### **Recommendations**

#### Planning and Design Phase

Include plans to minimize fire hazards and dust generation, and rehabilitation plans for areas temporarily cleared during construction. Sites for construction camps and laydown areas should be located in low visibility areas, existing disturbed areas and/ or areas near disused farmsteads and buildings, or where existing trees can be used to screen these sites from views. A lighting plan for the project which protects the surrounding nightscape from light pollution and prevents annoyance of glaring lights onto neighboring properties should be set in place.

#### Construction Phase

Adherence to the erosion, dust, fire and light plans are necessary to minimise visual intrusion of construction activities and should be monitored regularly by the construction manager. Construction boundaries should be clearly demarcated and monitored, and good housekeeping on site should be maintained. Rehabilitation of temporary cleared areas should commence as soon as possible, and the rehabilitation process should be regularly monitored by the Environmental Officer.

#### Operational Phase

A maintenance plan for buildings and structures should be followed to ensure that structures remain reasonably unobtrusive. Maintenance of access and service roads should not cause further disturbance and damage to the surrounding landscape.

Considering this VIA and the overall low significance of the potential visual impact, there is no reason that this project should not be authorised and from a visual impact perspective, the proposed development is acceptable. For further information on the Visual Impact Assessment see Chapter Twelve of the EIA Report.

### **SECURITY RECOMMENDATIONS**

While no “formal” impact assessment was undertaken with regards to the potential security which the development may pose during the construction and operational phase of the project, an independent specialist did evaluate this assertion and provided some comments on buffers and other measures to reduce potential security risks.

Concerns were raised that Ikamva Lethu staff members *may* increase the risk of poaching on Mr van der Westhuizen’s (registered I&AP) property during the development phase if they see rhino or exotic game. For this specific factor to come into play and become relevant, the following elements must manifest:

- We must assume that some Ikamva Lethu employees/ contractors are criminally inclined;
- Have access to instruments to poach namely rifle, ammunition, etc.;
- Have opportunity i.e. access to the property where rhino/ game are kept;
- Have motive;
- Be reasonably sure that their actions will go unnoticed or undetected.

#### **Buffer Zone**

The buffer zone adjacent to Mr van der Westhuizen’s property (Farm 4/632 and 83/558), which has been determined as a result of biodiversity constraints (e.g. soil suitability, vegetation conservation, aquatic buffers), will serve as an adequate early detection zone (EDZ) and in addition will hinder sight into Mr. van der Westhuizen’s property. In line with the biodiversity constraints, this buffer zone will be at a minimum of 300m wide. The natural vegetation and topography on or near the communal boundaries with Mr. van der Westhuizen’s property forms a virtual buffer zone. While it is not a required recommendation of this report to erect additional fences, it is noted that Ikamva Lethu will fence in the developed portion of their site, in order to secure their product.

The buffer zone will not be implemented as a precaution against stray bullets *as that should and must never happen*. In line with the biodiversity constraints and recommendations of the various specialists, access to the buffer zone should be

restricted. Warning signs should be strategically posted on the inner perimeter of proposed buffer zone to indicate to staff that access to this area is restricted.

For further information on the Security Risk Assessment, including the proposed security strategy see Chapter Thirteen of the EIA Report.

### **LOGISTICAL SERVICES AREA DESIGN AND RENOVATIONS RECOMMENDATIONS**

Existing buildings on site are proposed to be renovated in order to provide the necessary administrative and logistical support for the proposed citrus development. While the footprints of the existing buildings are not proposed to be expanded, existing infrastructure associated with these facilities will require upgrading and expansion, including the installation of new supporting infrastructure e.g. water reticulation, internal roads, access roads and access points.

A Roads and Wet Services Report (see Chapter Eleven) has been prepared by a suitably qualified professional, in order to determine the capacity of the existing services to accommodate the administrative staff, as well as the residents associated with the proposed development. Recommendations have also been provided regarding domestic water supply, road alignment and structure as well as stormwater management.

### **ASSESSMENT OF ALTERNATIVES**

The following alternatives were identified for consideration in this assessment:

- No-go alternative;
- Property/ location alternatives;
- Land-use alternatives:
  - Grazing/ game;
  - Citrus production; and
- Layout/ development footprint alternatives
- Irrigation infrastructure alternatives

The no-go option would result in the loss of potentially productive agricultural land in an area known for citrus production and at a site that is largely surrounded by agricultural development. The no-go option would result in the loss of a capital investment estimated to be approximately R225 million. The operational phase of the project will result in the creation of 62 permanent employment opportunities with an annual income of approximately R2.2 million and 566 seasonal employment opportunities with an additional annual income of R6.8 million. In addition, given that this proposed agricultural development is an empowerment project the benefits to the potential beneficiaries will not be realized. The no-go option would result in a loss of these economic opportunities, as well as the increased production of food for local and international markets, which is considered to be a negative impact. While the no-go option will have no significant negative biophysical environmental impacts, it will result in the loss of positive social and economic benefits which are associated with the go option. Finally, the no-go option will result in the Farm not being optimally utilized for agriculture, for which it is zoned and well-positioned.

The preferred land-use, layout and irrigation alternatives are described in full in Chapter Two of the EIA Report. Positive impacts associated with the **go option** are maximizing the use of available agricultural land whilst generating income from foreign currency (through export of citrus), thereby contributing to local economic growth, as well as assist in stimulating local markets. In addition, given that this agricultural development is an empowerment project there will be additional benefits to be realized for beneficiaries associated with the project, which is required be maintained at a minimum of 59% in terms of the water use license. The proposed development footprint has been informed by the relevant specialist assessments and mitigation measures have been recommended in order to reduce the impact of the proposed development on the biophysical environment. A full discussion of the assessment of alternatives is contained in Chapter Five of the EIA Report.

### **OVERALL EVALUATION OF IMPACTS**

Ikamva Lethu Farms (Pty) Ltd is a BEE citrus farming business initiated by the Sundays River Citrus Company (SRCC). The establishment of Ikamva Lethu Farms (Pty) Ltd has been guided by the National Development Plan (NDP) pertaining to land reform, empowerment and transformation within the agricultural industry. The objective being to transfer farming enterprises to farm workers, while the farmer or landowner retains ownership of half of the shares.

Having launched a transformation strategy in 2006, SRCC has three existing empowerment farming enterprises, excluding Ikamva Lethu, which are owned by workers' trusts – Luthando Farm, Mbuyiselo Farm and the Sundays River Farming Trust. Luthando Farm, which is 75% owned by the workers' trust and 25% owned by SRCC, has a total export production exceeding

200,000 citrus cartons per year. Mbuyiselo Farm, which is wholly owned by a workers' trust, has a total export production exceeding 75,000 citrus cartons per year. Finally, the Sundays River Farming Trust, which consists of five consolidated farms – the land of which is still mostly owned by the government – has a current total export production of about 450,000 citrus cartons per year.

It is estimated the capital investment of the development, upon completion of the construction phase, will be ~R225 million. It is estimated that the construction phase of the development will create ~66 new employment opportunities at a value of ~R21.4 million (over a five-year period). Upon completion of construction and during the operational phase of the development, it is estimated that ~62 permanent employment opportunities will be created at a value of ~R2.2 million annually, and ~566 seasonal opportunities at an annual value of ~R6.8 million. Labour will be sourced locally from communities in the SRVM and Nelson Mandela Bay Municipality (NMBM). In addition to the direct employment opportunities that are created as part of the farming operations, a number of indirect jobs will also be created by the proposed development particularly within the packaging and logistics industries, as well as the processing (juicing) industry amongst others.

Based on the outcome of the detailed specialist assessments, technical input and consultation process, it is proposed that ~650ha (56%) of vegetation on Farm 653 be cleared in order to facilitate the establishment of ~586ha of citrus orchards and ~64ha of associated infrastructure.

The additional clearance of ~650ha will result in ~43.5% of the vegetation on Farm 653 being retained. By adopting the proposed no-go areas and all mitigation measures recommended by the Ecological Specialists, the biodiversity pattern target area for the various vegetation types, and the hydrological/ ecological process areas associated with aquatic features, will be safeguarded. In addition, these final no-go areas exceed the targets delimited on the SRV CBA Map and can be interpreted as a **positive outcome in terms of preserving biodiversity on Farm 653**. In addition, the sensitive vegetation type, Bontveld has been excluded from the development footprint, thus preserving the habitat of several rare, threatened and endemic species which could potentially occur on site.

By applying the mitigatory measures proposed *Construction Phase* direct and indirect impacts of medium to high significance can mostly be reduced to impacts of *medium to low negative or neutral impacts*. The key direct and indirect impacts associated with the *Operational Phase* of the development can, by applying the mitigatory measures proposed is reduced from negative impacts of high to medium significance to *impacts of medium to low significance*.

The Environmental Assessment process has not identified any negative impacts that should be considered "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. Taking into consideration the findings of the EIA process, it is the opinion of the Environmental Assessment Practitioner that the project benefits outweigh the negative residual environmental impacts, provided that the specified mitigation measures are applied effectively, it is proposed that the project receive environmental authorization in terms of the EIA process.

## TABLE OF CONTENTS

	Page No.
<b>CHAPTER ONE: INTRODUCTION AND BACKGROUND</b>	<b>1.1</b>
1.1 BACKGROUND AND PROJECT OVERVIEW	1.1
1.1.1 About the Project Applicant	1.3
1.2 PROJECT NEED AND DESIRABILITY	1.4
1.3 REQUIREMENTS FOR SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT	1.8
1.4 EIA TEAM	1.9
1.5 DETAILS AND EXPERTISE OF THE EAP AND EXPERTISE TO CARRY OUT SCOPING AND EIA	1.9
1.6 OBJECTIVES OF THE EIA PROCESS	1.10
<b>CHAPTER TWO: PROJECT DESCRIPTION</b>	<b>2.1</b>
2.1 INTRODUCTION	2.1
2.1.1 Proposed Project Location	2.2
2.2 PROPOSED PROJECT SCOPE AND ACTIVITIES	2.6
2.2.1 Preconstruction	2.10
2.2.2 Construction	2.10
2.2.2.1 <i>Vegetation Clearing and Landscaping</i>	2.11
2.2.2.2 <i>Securing the Site</i>	2.11
2.2.2.3 <i>Internal Roads and Access</i>	2.12
2.2.2.4 <i>Installation of Irrigation Infrastructure and Construction of Dams</i>	2.13
2.2.2.5 <i>Renovation of Existing Structures</i>	2.14
2.2.2.6 <i>Logistical Services Area – New Supporting Infrastructure</i>	2.16
2.2.2.7 <i>Windbreaks</i>	2.16
2.2.3 Operational	2.17
2.2.3.1 <i>Orchard Establishment</i>	2.17
2.2.3.2 <i>Water Use Entitlements and Availability</i>	2.17
2.3 CAPITAL INVESTMENT AND EMPLOYMENT GENERATION	2.18
2.4 PROJECT SCHEDULE	2.18
2.5 CONCLUDING REMARKS	2.19
<b>CHAPTER THREE: DESCRIPTION OF THE AFFECTED ENVIRONMENT</b>	<b>3.1</b>
3.1 INTRODUCTION	3.1
3.2 GEOGRAPHICAL CONTEXT	3.2
3.2.1 Site Locality and Overview	3.2
3.2.2 Surrounding Land-use	3.4
3.3 ENVIRONMENTAL ATTRIBUTES	3.7
3.3.1 Biological	3.7
3.3.1.1 <i>Aquatic Vegetation</i>	3.7
3.3.1.2 <i>Terrestrial Vegetation</i>	3.11
3.3.1.3 <i>Fauna</i>	3.18
3.3.2 Physical	3.19
3.3.2.1 <i>Climate</i>	3.19
3.3.2.2 <i>Geohydrology and Surface Water</i>	3.19
3.3.2.3 <i>Geology and Topography</i>	3.19
3.3.2.4 <i>Agricultural Potential</i>	3.21
3.3.3 Heritage and Cultural	3.23
3.3.4 Socio-economic (Social and Economic)	3.24
3.4 ON – SITE OBSERVATIONS	3.25
3.4.1 Sausage Casing Facility	3.25
3.4.2 Other Existing Buildings and Infrastructure	3.26
3.4.3 Vegetation on Site and Levels of Degradation	3.26
3.4.4 Fauna	3.27
3.4.5 Geohydrology and Surface Water	3.27
3.4.6 Heritage and Cultural	3.27
3.5 CONCLUSIONS AND RECOMMENDATIONS	3.29

<b>CHAPTER 4: ENVIRONMENTAL IMPACT ASSESSMENT PROCESS AND PUBLIC PARTICIPATION</b>	<b>4.1</b>
4.1 INTRODUCTION	4.1
4.2 LEGAL CONTEXT FOR THIS EIA	4.1
4.3 LEGISLATION AND GUIDELINES APPLICABLE TO THIS EIA	4.6
4.3.1 National Legislation	4.6
4.3.1.1 <i>The Constitution of the Republic of South Africa (Act 108 of 1996):</i>	4.6
4.3.1.2 <i>NEMAA (as amended) and the EIA Regulations 2014 (as amended) published under Chapter 5 of NEMA (GN R326, GN R327, GN R325 and GN R324):</i>	4.6
4.3.1.3 <i>National Environmental Management Biodiversity (NEMBA) (Act 10 of 2004):</i>	4.7
4.3.1.4 <i>National Forests Act (NFA) (Act 84 of 1998)</i>	4.7
4.3.1.5 <i>National Heritage Resources Act (NHRA) (Act 25 of 1999)</i>	4.8
4.3.1.6 <i>National Water Act (Act 36 of 1998)</i>	4.8
4.3.1.7 <i>National Environmental Management: Protected Areas Act (Act 57 of 2003)</i>	4.9
4.3.1.8 <i>Conservation of Agricultural Resources Act (Act 43 of 1983)</i>	4.9
4.3.1.9 <i>Other Applicable National Legislation</i>	4.10
4.3.2 Provincial and Local Legislation	4.10
4.3.2.1 <i>Cape Nature and Environmental Conservation Ordinance (19 of 1974)</i>	4.10
4.3.2.2 <i>Eastern Cape Heritage Resources Act (Act 9 of 2003)</i>	4.11
4.3.2.3 <i>Other Applicable Provincial and Local Legislation</i>	4.11
4.3.3 Policies and Guidelines	4.11
4.4 OVERVIEW OF THE SCOPING AND EIA PROCESS	4.11
4.4.1 Principles for Public Participation	4.13
4.4.2 Authority Consultation	4.14
4.4.3 Database Development and Maintenance including Information Sharing	4.15
4.5 PUBLIC PARTICIPATION PROCESS	4.16
4.5.1 Compile Draft EIA Report and EMPr	4.16
4.5.2 Review of the Draft EIA (and EMPr) and Ongoing Communication	4.17
4.5.3 Compilation of the Final EIA and EMPr for Submission to Authorities	4.17
4.5.4 Decision on Application and Appeal Period	4.17
4.6 IDENTIFICATION OF ISSUES	4.18
4.7 CONCLUDING REMARKS	4.71
<b>CHAPTER FIVE: IDENTIFICATION AND ASSESSMENT OF ALTERNATIVES</b>	<b>5.1</b>
5.1 APPROACH TO THE ASSESSMENT OF ALTERNATIVES	5.1
5.2 NO-GO ALTERNATIVE	5.2
5.3 PROPERTY/ LOCATION ALTERNATIVES	5.3
5.3.1 Skietnek (RE and Portion 3 of Farm 82 and RE of Farm 81)	5.3
5.3.2 Remainder of Farm 653	5.6
5.4 LAND USE/ ACTIVITY ALTERNATIVES	5.7
5.4.1 Grazing (not preferred)	5.7
5.4.2 Citrus Production (preferred alternative)	5.8
5.5 LAYOUT ALTERNATIVES	5.9
5.5.1 Alternative 1 (not preferred)	5.10
5.5.2 Alternative 2 (preferred)	5.12
5.6 IRRIGATION INFRASTRUCTURE ALTERNATIVES	5.15
5.6.1 Alternative 1 (not preferred)	5.15
5.6.2 Alternative 2 (preferred)	5.18
5.7 CONCLUDING REMARKS	5.21
<b>CHAPTER SIX: AQUATIC SPECIALIST ASSESSMENT</b>	<b>6.1</b>
6.1 INTRODUCTION	6.1
6.2 SPECIALIST TERMS OF REFERENCE	6.1
6.3 APPROACH AND METHODOLOGY	6.1
6.3.1 Assumptions and Limitations	6.1
6.3.2 Information Sources	6.2
6.3.1.1 <i>Biodiversity Planning Frameworks</i>	6.2
6.3.1.2 <i>Internet Resources</i>	6.2
6.3.1.3 <i>Other</i>	6.2
6.3.3 Authority Consultation Process	6.2
6.3.4 Modelling, Analysis and Fieldwork Undertaken	6.2

6.4	LEGISLATIVE REQUIREMENTS	6.4
6.5	PROJECT DESCRIPTION	6.8
6.5.1	Project Specifications	6.8
6.5.2	Near natural vegetation cover and proposed clearance statistics	6.8
6.6	BIODIVERSITY PLANNING FRAMEWORKS: OVERVIEW AND VALUATION	6.9
6.6.1	The Sundays River Valley CBA Map (Skowno and Holness, 2012)	6.9
6.6.1.1	<i>Critical Evaluation: Site observations compared with the CBA Map</i>	6.12
6.6.2	The Eastern Cape Biodiversity Conservation Plan's CBA Map (Berliner and Desmet, 2007)	6.14
6.6.2.1	<i>Critical Evaluation: Site observations compared with the CBA Map</i>	6.17
6.6.3	The Maputoland-Pondoland-Albany Hotspot Biodiversity Conservation Plan (2010)	6.17
6.6.4	The National and Provincial Protected Area Expansion Strategies	6.18
6.7	AVAILABLE DATA: VEGETATION AND FLORISTICS	6.18
6.7.1	Existing Broad-Scale Vegetation Maps	6.19
6.7.2	Available Data: Species of Conservation Concern	6.24
6.8	RESULTS	6.25
6.8.1	Vegetation and Floristics	6.25
6.8.1.1	<i>Proposed Citrus Area: Vegetation and Floristics</i>	6.25
6.8.1.2	<i>Proposed Pipeline Route: Vegetation &amp; Floristics</i>	6.29
6.8.2	Species of Special/ Conservation Concern	6.35
6.8.2.1	<i>Proposed Citrus Area on Farm 653</i>	6.35
6.8.2.2	<i>Proposed Pipeline Route</i>	6.35
6.8.3	Land Cover, Land Use and Associated Land Use Impacts: Level of Modification and Transformation	6.39
6.8.4	Vegetation Sensitivity Map	6.40
6.8.5	Combined Results: Biodiversity No-Go Areas and Agricultural Exclusion Zones	6.42
6.8.5.1	<i>Biodiversity No-Go Areas</i>	6.42
6.8.5.2	<i>Final agricultural go areas based on the biodiversity no-go areas and the other no-go areas</i>	6.44
6.9	IDENTIFICATION AND ASSESSMENT OF IMPACTS	6.48
6.9.1	Construction Phase Direct Impact	6.48
6.9.2	Indirect Construction Phase Impacts	6.52
6.9.3	Construction Phase Cumulative Impacts	6.53
6.9.4	Operation Phase Direct Impacts	6.56
6.9.5	Indirect Operational Phase Impacts	6.56
6.9.6	Operational Phase Cumulative Impacts	6.56
6.10	ENVIRONMENTAL MONITORING PROGRAMME RECOMMENDATIONS	6.56
6.11	CONCLUSIONS AND RECOMMENDATIONS	6.56
6.11.1	Impact Statement	6.56
6.11.2	Permitting and Licensing Requirements	6.58
6.12	DESKTOP FAUNAL ASSESSMENT	6.58
6.12.1	Methodology and Approach	6.58
6.12.1.1	<i>Assumptions and Limitations</i>	6.58
6.12.1.2	<i>Information Sources</i>	6.59
6.12.2	Description of the Environment	6.59
6.12.2.1	<i>Invertebrates</i>	6.59
6.12.2.2	<i>Amphibians and Reptiles</i>	6.60
6.12.2.3	<i>Birds</i>	6.62
6.12.2.4	<i>Mammals</i>	6.63
6.12.3	Faunal Recommendations	6.64
6.13	PERMIT REQUIREMENTS	6.64
6.14	FAUNAL RISK/ IMPACT ASSESSMENT	6.64
6.14.1	Impact Assessment Methodology	6.64
6.14.2	Assessment of Identified Impacts	6.66
6.14.3	Concluding Statement	6.68
6.15	VEGETATION ASSESSMENT REFERENCES	6.70
6.16	FAUNAL ASSESSMENT REFERENCES	6.71
6.17	APPENDICES	6.72

<b>CHAPTER SEVEN: ECOLOGICAL SPECIALST ASSESSMENT</b>		<b>7.1</b>
7.1	INTRODUCTION	7.1
7.2	SPECIALIST TERMS OF REFERENCE	7.1
7.3	APPROACH AND METHODOLOGY	7.1
7.3.1	Assumptions and Limitations	7.1
7.3.2	Information Sources	7.2
7.3.1.1	<i>Biodiversity Planning Frameworks</i>	7.2
7.3.1.2	<i>Internet Resources</i>	7.2
7.3.1.3	<i>Other</i>	7.2
7.3.3	Authority Consultation Process	7.2
7.3.4	Modelling, Analysis and Fieldwork Undertaken	7.3
7.4	LEGISLATIVE REQUIREMENTS	7.5
7.5	PROJECT DESCRIPTION	7.10
7.5.1	Project Specifications	7.10
7.5.2	Catchment Location: Proposed agricultural activities relative to aquatic features	7.11
7.6	BIODIVERSITY PLANNING FRAMEWORKS: OVERVIEW AND ASSESSMENT	7.12
7.6.1	The National Freshwater Ecosystem Priority Areas Map (Nel et al., 2011): River and Catchment	7.12
7.6.2	The Sundays River Valley CBA Map (Skowno and Holness, 2012)	7.14
7.6.3	The Eastern Cape Biodiversity Conservation Plan's CBA Map (Berliner and Desmet, 2007)	7.15
7.6.3.1	<i>Evaluation: Site Observations relative to Aquatic CBA Map and Catchment Transformation Levels</i>	7.17
7.6.3.2	<i>The ECBCP versus the NFEPA Map.</i>	7.19
7.7	RESULTS	7.19
7.7.1	The Bio-Physical Environment: General Climate, Topography and Geology	7.19
7.7.2	Wetland Habitat, Rivers and Drainage Areas	7.20
7.7.2.1	<i>Wetland Delineation</i>	7.23
7.7.2.2	<i>Wetland Present Ecological State (PES)</i>	7.34
7.7.2.3	<i>Wetland Ecological Importance and Ecological Sensitivity</i>	7.36
7.7.2.4	<i>Rivers and Ephemeral Drainage Areas Delineation</i>	7.39
7.7.2.5	<i>Watercourse Present Ecological State (PES)</i>	7.43
7.7.2.6	<i>Watercourse Ecological Importance and Sensitivity</i>	7.44
7.7.3	Aquatic Resources: Recommendations	7.44
7.7.3.1	<i>Introduction: Generic Buffers indicated for the Province and Other</i>	7.44
7.7.3.2	<i>Buffer recommendations for this assessment</i>	7.45
7.7.4	Biodiversity No-Go Areas and Agricultural Exclusion Zones	7.47
7.8	IDENTIFICATION AND ASSESSMENT OF IMPACTS	7.48
7.8.1	Construction Phase Direct Impacts	7.49
7.8.2	Indirect Construction Phase Impacts	7.55
7.8.3	Construction Phase Cumulative Impacts	7.58
7.8.4	Operational Phase Direct Impacts	7.59
7.8.5	Indirect Operational Phase Impacts	7.64
7.8.6	Operational Phase Cumulative Impacts	7.64
7.9	ENVIRONMENTAL MONITAIORING PROGRAMME RECOMMENDATIONS	7.65
7.10	CONCLUSIONS AND RECOMMENDATIONS	7.68
7.10.1	Impact Statement	7.68
7.10.2	Permitting and Licensing Requirements	7.71
7.11	REFERENCES	7.71
7.12	APPENDICES	7.74
<b>CHAPTER EIGHT: TRAFFIC IMPACT ASSESSMENT</b>		<b>8.1</b>
8.1	INTRODUCTION	8.1
8.2	SPECIALIST TERMS OF REFERENCE	8.1
8.3	APPROACH AND METHODOLOGY	8.1
8.4	LAND USE RIGHTS, DEVELOPMENT AND ENVIROS	8.1
8.4.1	Land Use Rights	8.1
8.4.2	Development Overview	8.2
8.5	DATA COLLECTION	8.4
8.5.1	Historical Daily Traffic Volumes	8.4

8.5.2	Road Network	8.4
8.6	TRIP GENERATION	8.5
8.7	PROPOSED ACCESS ARRANGEMENTS	8.5
8.8	IDENTIFICATION AND ASSESSMENT OF POTENTIAL IMPACTS	8.6
8.8.1	Impacts	8.6
8.8.2	Impact Assessment	8.7
8.8.3	Construction Phase Direct Impacts	8.8
8.8.4	Operational Phase Direct Impacts	8.9
8.9	PROPOSED MITIGATORY MEASURES	8.10
8.9.1	Road Condition Measures	8.10
8.9.2	Traffic Safety Measures	8.10
8.10	MANAGEMENT ACTIONS	8.11
8.11	CONCLUSIONS	8.11
8.12	RECOMMENDATIONS	8.11
8.13	REFERENCES	8.11
8.14	APPENDICES	8.12
<b>CHAPTER NINE: SOIL SUITABILITY ASSESSMENT</b>		<b>9.1</b>
9.1	INTRODUCTION	9.1
9.2	SPECIALIST TERMS OF REFERENCE	9.1
9.3	CONSULTATION	9.1
9.4	FIELD SOIL SURVEY AND THE RECONNAISSANCE SOIL MAP	9.2
9.5	SUITABILITY OF SOIL TYPES FOR CROP PRODUCTION	9.12
9.6	SOIL LIMITATIONS	9.13
9.6.1	Dense subsoil clay layers (pans)	9.13
9.6.2	High clay content in topsoil	9.13
9.6.3	Wetness	9.13
9.6.4	High alkalinity	9.13
9.6.5	Coarse fragments in top- and/ or subsoil	9.14
9.6.6	Cemented subsoil hardpans	9.14
9.6.7	Other limitations	9.14
9.7	AMELIORATION MEASURES	9.14
9.8	RECOMMENDATIONS	9.15
9.9	REFERENCES	9.15
9.10	ACKNOWLEDGEMENT	9.15
9.11	ANNEXURE 1	9.16
9.12	ANNEXURE 2	9.21
9.13	ANNEXURE 3	9.25
<b>CHAPTER TEN: HERITAGE IMPACT ASSESSMENT</b>		<b>10.1</b>
10.1	INTRODUCTION	10.1
10.2	SPECIALIST TERMS OF REFERENCE	10.1
10.3	PROJECT INFORMATION	10.1
10.4	METHODOLOGY	10.4
10.4.1	Site Information	10.4
10.5	BACKGROUND INFORMATION	10.6
10.5.1	Palaeontology	10.6
10.5.2	Archaeology	10.7
10.6	RESULTS	10.7
10.7	IMPACT STATEMENT AND RECOMMENDATION	10.12
10.7.1	Palaeontology	10.12
10.7.2	Archaeology	10.14
10.8	REFERENCE	10.15
<b>CHAPTER ELEVEN: ROADS AND WET SERVICES REPORT</b>		<b>11.1</b>
11.1	INTRODUCTION	11.1
11.2	SPECIALIST TERMS OF REFERENCE	11.1
11.3	SCOPE OF WORK	11.1
11.4	DATA COLLECTION	11.1
11.4.1	Site Boundaries	11.1
11.4.2	Citrus Plantation Logistic Facilities	11.1
11.4.3	Field Records and Observations	11.2



11.4.4	Engineering Geological Report	11.2
11.5	ANALYSIS	11.2
11.5.1	Methodology	11.2
11.5.2	Acceptable Objectives	11.3
11.5.3	Appropriate Design Standards	11.3
11.6	INVESTIGATION AND PRELIMINARY DESIGN	11.3
11.6.1	Roads - Access	11.3
11.6.2	Roads - Structural	11.4
11.6.3	Roads – Geometric Design	11.4
11.6.4	Stormwater System	11.5
11.6.5	Water Supply System	11.6
11.6.6	Domestic Effluent System	11.7
11.7	RESOURCE PROTECTION AND WATER USE AUTHORISATION	11.8
11.8	CONCLUSION	11.8
11.9	APPENDIX	11.9
11.9.1	Layout Drawings	11.9
<b>CHAPTER TWELVE: VISUAL IMPACT ASSESSMENT</b>		<b>12.1</b>
12.1	INTRODUCTION	12.1
12.2	SPECIALIST TERMS OF REFERENCE	12.1
12.3	PROJECT INFORMATION AND METHODOLOGY	12.1
12.3.1	Project Description, Purpose and Objectives	12.1
12.3.2	Approach and Methodology	12.2
12.3.3	Information Sources	12.3
12.3.4	Assumptions and Limitations	12.3
12.3.5	Consultation Process	12.4
12.4	PROJECT ASPECTS RELEVANT TO VISUAL IMPACTS	12.4
12.4.1	Construction Phase	12.4
12.4.2	Operational Phase	12.5
12.5	DESCRIPTION OF THE AFFECTED ENVIRONMENT	12.5
12.6	APPLICABLE LEGISLATION, PERMIT REQUIREMENTS AND MUNICIPAL DEVELOPMENT PLANS	12.8
12.7	ISSUES, RISKS AND IMPACTS	12.9
12.7.1	Key Issues Identified During the Scoping Phase	12.9
12.7.2	Identification of Potential Impacts	12.11
12.7.2.1	<i>Construction Phase</i>	12.15
12.7.2.2	<i>Operational Phase</i>	12.15
12.8	VISUAL IMPACT CONCEPTS AND ASSESSMENT CRITERIA	12.15
12.8.1	Visibility Ratings	12.15
12.8.2	Visual Exposure	12.16
12.8.2.1	<i>Agricultural Development</i>	12.19
12.8.2.2	<i>Pipeline Construction</i>	12.19
12.8.3	Visual Intrusion	12.19
12.8.3.1	<i>Photographic Survey</i>	12.19
12.8.3.2	<i>Ikamva Lethu Agricultural Development</i>	12.25
12.8.3.3	<i>Construction Activities Associated with the Pipeline</i>	12.26
12.9	ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS	12.31
12.9.1	Construction Phase: Potential visual intrusion of activities associated with the construction of structures and features associated with the proposed agricultural development, on existing views of sensitive visual receptors in the surrounding landscape	12.31
12.9.1.1	<i>Significance Statement</i>	12.31
12.9.1.2	<i>Mitigation Measures</i>	12.31
12.9.2	Construction Phase: Potential visual intrusion of activities associated with the proposed pipeline, on existing views of sensitive visual receptors in the surrounding landscape	12.33
12.9.2.1	<i>Significance Statement</i>	12.33
12.9.2.2	<i>Mitigation Measures</i>	12.33
12.9.3	Operational Phase: Potential landscape impact of the proposed agricultural development, on a mixed agricultural landscape character	12.34
12.9.3.1	<i>Significance Statement</i>	

12.9.4	Operational Phase: Potential visual intrusion of the proposed agricultural development, on the existing views of sensitive visual receptors in the surrounding landscape	12.34
12.9.4.1	<i>Significance Statement</i>	12.34
12.9.4.2	<i>Mitigation Measures</i>	12.35
12.10	RECOMMENDATIONS TO THE ENVIRONMENTAL MANAGEMENT PROGRAMME	12.35
12.10.1	Planning and Design	12.35
12.10.2	Construction Phase	12.36
12.10.3	Operational Phase	12.36
12.11	IMPACT ASSESSMENT SUMMARY	12.36
12.12	CONCLUSIONS AND RECOMMENDATIONS	12.36
12.13	REFERENCES	12.37
12.14	APPENDICES	12.38
12.14.1	Maps	12.38
<b>CHAPTER THIRTEEN: SECURITY RISK ASSESSMENT</b>		<b>13.1</b>
13.1	INTRODUCTION	13.1
13.2	SPECIALIST TERMS OF REFERENCE	13.1
13.3	SECTION A: CURRENT CRIME THREAT	13.1
13.3.1	Relevant Crime Statistics	13.1
13.3.2	Law Enforcement	13.2
13.4	SECTION B: CONCERNS BY INTERESTED AND AFFECTED PARTY	13.2
13.4.1	Rhino and Exotic Game Security (paragraph two and five)	13.2
13.5	FACTORS INFLUENCING POACHING THREAT OR POACHING PROBABILITY	13.3
13.6	OBSERVATIONS	13.3
13.7	THE HUMAN FACTOR	13.4
13.8	SECURITY PROPOSAL	13.4
13.9	SECURITY STRATEGY – IKAMVA LETHU	13.6
13.10	SECURITY STRATEGY PROPOSAL	13.6
<b>CHAPTER FOURTEEN: CONCLUSIONS AND RECOMMENDATIONS</b>		<b>14.1</b>
14.1	INTRODUCTION	14.1
14.2	IMPACTS ON ECOLOGY AND RECOMMENDED MITIGATORY MEASURES	14.2
14.2.1	Impacts and Management of Ecology	14.3
14.2.2	Summary and Additional Recommendations	14.8
14.3	HERITAGE IMPACTS AND RECOMMENDATIONS	14.10
14.3.1	Palaeontological, Archaeological and Historical Background	14.10
14.3.2	Heritage Resources Identified	14.11
14.3.3	Impacts and Management of Heritage Resources	14.11
14.4	TRAFFIC IMPACTS AND RECOMMENDATIONS	14.12
14.5	VISUAL IMPACTS AND RECOMMENDATIONS	14.13
14.5.1	Recommendations	14.14
14.6	SECURITY RECOMMENDATIONS	14.14
14.6.1	Factors Influencing Poaching Threat or Poaching Probability	14.14
14.6.2	Observations	14.15
14.6.3	Buffer Zone	14.16
14.6.4	Security Strategy Proposal	14.16
14.7	LOGISTICAL SERVICES AREA DESIGN AND RENOVATIONS RECOMMENDATIONS	14.17
14.7.1	Roads	14.17
14.7.2	Stormwater	14.17
14.7.3	Water	14.18
14.7.4	Domestic Effluent System	14.18
14.7.5	Chemical Store	14.19
14.8	ASSESSMENT OF ALTERNATIVES	14.19
14.8.1	No-Go Option	14.19
14.8.2	Property/ Location Alternatives	14.20
14.8.3	Land Use Alternatives: Citrus Production	14.20
14.8.4	Layout Alternatives	14.22
14.8.5	Irrigation Infrastructure Alternatives	14.22
14.9	PERMIT REQUIREMENTS	14.23
14.10	OVERALL EVALUATION OF IMPACTS	14.23

<b>MAPS</b>		
Map 1.1	The location of the area under assessment which includes the Remainder of Farm 653 and the properties affected by the proposed irrigation pipeline corridor. Map insert (top left) indicating the distance of the Addo Elephant National Park (green border) from the boundary of Farm 653 (~9.8km).	1.2
Map 2.1	A plan indicating the coordinates of the boundary of the Remainder of Farm 653 upon which the agricultural development is proposed to take place.	2.3
Map 2.2	A plan indicating the northern (north of the R336 road) portion of the pipeline corridor and the coordinates of the sections thereof which trigger listed activities.	2.4
Map 2.3	A plan indicating the southern (south of the R336 road) portion of the pipeline corridor and the coordinates of the sections thereof which trigger listed activities.	2.5
Map 2.4	The preferred development footprint, indicating the proposed orchard layout and associated infrastructure, on Farm 653.	2.7
Map 2.5	The preferred Logistical Services layout including associated infrastructure, on Farm 653.	2.8
Map 2.6	Location of existing infrastructure on the Remainder of Farm 653.	2.9
Map 2.7	Existing (yellow dots) and proposed (red dots) access points as indicated by the Traffic Specialist.	2.12
Map 3.1	The location of the area under assessment which includes the Remainder of Farm 653 and the properties affected by the proposed irrigation pipeline corridor. Map insert (top left) indicating the distance of the Addo Elephant National Park (green border) from the boundary of Farm 653 (~9.8km).	3.3
Map 3.2	Properties (yellow outline) adjacent to the Remainder of Farm 653 (red outline), indicating the current surrounding land use.	3.4
Map 3.3a	The current land-use of the properties north of the R336 road (purple outline), which are affected by the proposed irrigation pipeline corridor (blue outline), as well as properties which surround the pipelines where they fall within the road reserve (yellow outline).	3.6
Map 3.3b	The current land-use of the properties south of the R336 road (purple outline), which are affected by the proposed irrigation pipeline corridor (blue outline), as well as properties which surround the pipelines where they fall within the road reserve (yellow outline).	3.6
Map 3.4	The Remainder of Farm 653 (red outline) and the proposed irrigation pipeline corridor (purple) does not fall within a Freshwater Ecosystem Priority Area, in terms of the NFEPA Mapping resources.	3.8
Map 3.5	The affected properties and proposed irrigation pipeline corridor, do not fall within a National Freshwater Ecosystem Priority Area. However, two NFEPA wetlands are mapped along the proposed irrigation pipeline corridor (purple) and the wetland habitat at the point of the crossing of the Sundays River is classified as a NFEPA wetland (lime green).	3.9
Map 3.6	The affected properties (indicated in red) and proposed irrigation pipeline corridor (indicated in blue), in terms of the ECBCP Aquatic CBA mapping resources.	3.11
Map 3.7	The affected properties (indicated in red) and proposed irrigation pipeline corridor (indicated in blue), as mapped in the NSBA mapping resources, showing the vegetation types present on site.	3.12
Map 3.8	The affected properties (red outline) and proposed irrigation pipeline corridor, in terms of the ECBCP Terrestrial CBA mapping resources.	3.14
Map 3.9	The affected properties and proposed irrigation pipeline corridor, as mapped in terms of the Sundays River Valley Municipality Biodiversity Sector Plan.	3.15
Map 3.10	The affected properties and proposed irrigation pipeline corridor, as mapped in the STEP mapping resources, showing the vegetation types present on site.	3.17
Map 3.11	The affected properties (red outline) and proposed irrigation pipeline corridor (blue), do not fall within a Biodiversity Corridor (purple) or a Protected Area (bright green), as identified in the STEP mapping resources.	3.18
Map 3.12	Fossil Sensitivity of the affected properties (red outline) and proposed irrigation pipeline corridor (blue).	3.20
Map 3.13	Contour map (5m contour intervals) showing topography of the affected properties and proposed irrigation pipeline corridor (red outline).	3.21
Map 3.14	The affected properties and proposed irrigation pipeline corridor, Agricultural Land Capability (AGIS, 2007, www.agis.agric.za).	3.22
Map 3.15	Location of a single grave site identified on the Remainder of Farm 653.	3.23
Map 5.1	Location of the farms collectively referred to as Skietnek.	5.4

Map 5.2	Opportunities and Constraints map prepared during the Rapid Environmental Risk Assessment for the farms collectively referred to as Skietnek.	5.5
Map 5.3	Location of the Remainder of Farm 653.	5.6
Map 5.4	Opportunities and Constraints map prepared during the Rapid Environmental Risk Assessment for the Remainder of Farm 653.	5.7
Map 5.5	Alternative 1 (not preferred) proposed to clear ~920ha of indigenous vegetation for the establishment of citrus orchards, including associated infrastructure, the expansion of an existing dam and the construction of three new dams. This alternative was based on the initial proposal, along with preliminary specialist and technical input. This layout was amended subsequent to additional specialist and technical input, and public participation.	5.11
Map 5.6	Alternative 2 (preferred) proposes to clear ~650ha of indigenous vegetation for the establishment of 586ha of citrus orchards, including associated infrastructure, the expansion of an existing dam and the construction of three new dams. This preferred alternative is based on additional specialist and technical input, as well as public participation.	5.13
Map 5.7	Proposed logistical services layout, including existing buildings to be utilised on site and proposed changes to the primary access point and associated access road.	5.14
Map 5.8	Irrigation Infrastructure Alternative 1 (not preferred), northern section of the pipeline corridor. Showing the single irrigation pipe (500mm diameter), single crossing of the Sundays River, as well as the properties affected by the pipeline corridor.	5.16
Map 5.9	Irrigation Infrastructure Alternative 1 (not preferred), southern section of the pipeline corridor. Showing the single irrigation pipe (500mm diameter) and the termination of the pipeline on the RE of Farm 653, as well as the properties affected by the pipeline corridor.	5.17
Map 5.10	Irrigation Infrastructure Alternative 2 (preferred), northern section of the pipeline corridor. Showing the double irrigation pipeline (2 x 450mm diameter pipes), single crossing of the Sundays River (single, 630mm diameter pipe), as well as the properties affected by the pipeline corridor.	5.19
Map 5.11	Irrigation Infrastructure Alternative 2 (preferred), southern section of the pipeline corridor. Showing the double irrigation pipeline (2 x 450mm diameter pipes) and the termination of the pipeline on the RE of Farm 653, as well as the properties affected by the pipeline corridor.	5.20

<b>PHOTOS</b>		
Photo 2.1	Example of internal service roads on an existing citrus farm in the Sundays River Valley.	2.13
Photo 2.2	Existing warehouse which is required to be renovated to be utilised for the storage of vehicles and machinery etc.	2.15
Photo 2.3	Existing buildings to be utilised for storage of equipment and for administrative facilities.	2.15
Photo 3.1	The single grave site identified on the Remainder of Farm 653.	3.24
Photo 3.2	Vegetable tunnels.	3.26
Photo 3.3	Poultry Facilities.	3.26
Photo 3.4	Shed.	3.26
Photo 3.5	Outbuildings.	3.26
Photo 3.6	Presence of <i>Opuntia ficus-indica</i> , indicated with white arrows, on a Portion of the Remainder of Farm 653, indicating a level of disturbance, possibly due to grazers and browsers.	3.27
Photo 3.7	Severely modified Sundays Spekboom Thicket and Koedoeskloof Karroid Thicket, indicated with red circles, on portions of the Farm to the north of the MR00470.	3.28
Photo 3.8	Proposed irrigation pipeline route crossing of the Sundays River, showing near-natural Riparian Vegetation.	3.28
Photo 3.9	A Section towards the north of the R336 road, where the irrigation pipeline is proposed to be installed in the road reserve indicating the modification in the vegetation.	3.29
Plate 6.1	Photographic images of the Thicket vegetation.	6.31
Plate 6.2	Photographic images of some of the species of special concern on site.	6.36
Plate 7.3	Wetland habitat along the proposed pipeline route.	7.31
Plate 7.4	Photographic images of the un-named non-perennial river, with wetland habitat.	7.40
Plate 7.5	Photographic images of some of the ephemeral drainage areas.	7.41

<b>TABLES</b>		
Table 1.1	EIA Team and Specialists.	1.9
Table 1.2	Summary of where information requirements in terms of Appendix 3 of the EIA Regulations, 2014, (as amended) are provided for in this report.	1.11
Table 2.1	Project cadastral information.	2.2
Table 2.2	Proposed project schedule.	2.18
Table 3.1	Activities on the land adjacent to the Remainder of Farm 653.	3.5
Table 4.1	Listed activities according to GN R327, 325 and 324 requiring Environmental Authorisation in terms of the NEMA EIA Regulations, 2014 (as amended).	4.2
Table 4.2	Summary of Issues Raised.	4.18
Table 4.3	Comments and Responses Trail.	4.19
Table 6.1	Existing near-natural areas and proposed clearance statistics.	6.9
Table 6.2	Terrestrial biodiversity land management classes (BLMC), Land Use Objectives, Aquatic CBA with recommended transformation thresholds and aquatic buffers (Berliner and Desmet, 2007).	6.16
Table 6.3	Vegetation types mapped on the proposed citrus orchards and pipeline route, with associated data (pre-transformation).	6.19
Table 6.4	Vegetation types supported on the farm with approximate area in hectares, including the biodiversity targets and extent in hectares	6.26
Table 6.5	Vegetation types supported along the proposed pipeline route with approximate area in hectares, vegetation which is near natural and degraded has been included.	6.30
Table 6.6	Alien invasive plants recorded on site.	6.30
Table 6.7	Species of Special Concern recorded on Farm 653.	6.35
Table 6.8	Species of special concern recorded along the proposed pipeline route.	6.36
Table 6.9	Sensitivity ratings for the vegetation cover on the farm.	6.40
Table 6.10	Vegetation sensitivity results.	6.41
Table 6.11	The criteria used for the selection of no-go areas to meet vegetation pattern biodiversity targets.	6.42
Table 6.12	Biodiversity no-go areas on Farm 653 compared with the required biodiversity targets per vegetation type.	6.44
Table 6.13	CBA and ESA mapped by the SRV CBA Map compared with the biodiversity no go areas.	6.44
Table 6.14	Vegetation types relative to the proposed areas for transformation, the biodiversity targets and areas retained post development.	6.45
Table 6.15	Summary of impacts pre- and post-mitigation.	6.56
Table 6.16	Potential invertebrate species of special concern.	6.60
Table 6.17	Conservation Status of amphibians that may potentially occur in the area.	6.60
Table 6.18	Conservation Status of reptiles that may occur in the area.	6.61
Table 6.19	Vulnerable Avifauna with distribution ranges that overlap with the study area.	6.63
Table 6.20	Protected mammal species that may occur on the site.	6.64
Table 6.21	Summary of faunal impacts pre- and post-mitigation.	6.69
Table 7.1	Descriptions of the A-F ecological categories (adapted from Kleynhans, 1996, Kleynhans, 1999; cited in DWAF, 2007 and Kleynhans et al., 2008).	7.4
Table 7.2	Aquatic CBA with recommended transformation thresholds and aquatic buffers (Berliner and Desmet, 2007).	7.17
Table 7.3	Land cover statistics for quaternary catchment N40E (GIS metadata Sundays River Valley land cover data).	7.18
Table 7.4	Land cover statistics for the sub- quaternary catchment of N40E (GIS metadata SRV land cover data).	7.18
Table 7.5	Summary of wetland habitat recorded.	7.23
Table 7.6	Descriptions of the wetland habitat relative to the proposed citrus area.	7.24
Table 7.7	Summary Results for the natural wetlands.	7.34
Table 7.8	Present Ecological State of the wetlands no. 9, 10 and 13.	7.35
Table 7.9	Preliminary rating of the hydrological benefits likely to be provided by a wetland given its particular hydro-geomorphic type (Kotze et al., 2008).	7.36
Table 7.10	Importance of wetland size in contributing to the provision of particular benefits (Kotze et al., 2008).	7.37
Table 7.11	Results via DWAF criteria methodology for determining ecological importance and ecological sensitivity.	7.38

Table 7.12	DWAF criteria methodology for determining hydro-functional importance.	7.39
Table 7.6	A synthesis of these studies for the key functions the buffer will provide, as cited in Macfarlane et al. (2009).	7.45
Table 7.7	Summary of impacts pre- and post-mitigation.	7.69
Table 8.1	ADT and Annual Growth Rates.	8.4
Table 8.2	Rural road Categories by Traffic Volume.	8.4
Table 8.3	Generic table for rating of impacts.	8.8
Table 8.4	Impact Assessment: Additional traffic Volumes.	8.8
Table 8.5	Impact Assessment: Traffic Safety Impact due to slow moving traffic.	8.8
Table 8.6	Impact Assessment: Road and Intersection capacity (additional traffic loading).	8.9
Table 8.7	Impact assessment: Traffic Safety Impact due to additional traffic.	8.9
Table 8.8	Impact Assessment: Deterioration of Public Road Network.	8.9
Table 8.9	Impact Assessment: Generation of Dust.	8.10
Table 9.1	Soil forms and families listed alphabetically, according to soil form abbreviation symbol.	9.3
Table 9.2	Brief description of soil types (and one land unit) on Farm 653, Kirkwood.	9.6
Table 9.3	Area (in ha) of individual soil types and average field rating for citrus.	9.11
Table 9.4	Interpretation of suitability ratings.	9.12
Table 9.5	Suitability and ha of Farm 653 for citrus after amelioration of physical limitations.	9.12
Table 12.1	Table entry extracted from Chapter Four of the Draft Consultation Scoping Report for the Ikamva Lethu project.	12.9
Table 12.2	Summary of the number of buildings potentially affected, as well as their corresponding visual exposure rating.	12.19
Table 12.3	Visual Impact Criteria and Impact Consequence for the Ikamva Lethu agricultural development.	12.27
Table 12.4	Impact Summary Rating for visual intrusion during construction of the proposed development.	12.32
Table 12.5	Impact Summary Rating for visual intrusion of construction activities associated with the proposed pipeline.	12.33
Table 12.6	Impact Summary Rating for a potential landscape impact of the proposed agricultural development, on a mixed agricultural landscape character.	12.34
Table 12.7	Impact Summary Rating for Potential visual intrusion of the proposed agricultural development, on the existing views of sensitive visual receptors in the surrounding landscape.	12.35
Table 12.8	Overall Impact Significance (Post-Mitigation).	12.36
Table 13.1	South African crime statistics relevant to both the Addo, as well as the Kirkwood police precincts.	13.1
Table 14.1	Ecological Importance, Ecological Sensitivity and Hydro-functional Importance of the wetlands.	14.5
Table 14.2	Key direct and indirect ecological impacts (Medium to High Negative pre-mitigation only).	14.8
Table 14.3	Key direct and indirect traffic impacts (Medium to High Negative pre-mitigation only).	14.13

<b>FIGURES</b>		
Figure 1.1	Extract from the National Development Plan (2030; Page 219).	1.6
Figure 1.2	Google Earth Image indicating the boundaries of the Remainder of Farm 653 (red) and its proximity to the cultivated 'Valley' area.	1.7
Figure 3.1	Breakdown of the Employment Sector for the Sundays River Valley Municipality (Final SRVM IDP 2015/ 2016).	3.25
Figure 6.1	Areas surveyed and GPS points and tracks recorded during the field assessment (Aquatic and Vegetation assessment) in 2015 (Top); and 2017 (Bottom).	6.3
Figure 6.2	Critical Biodiversity Area (CBA), Ecological Support Area (ESA) and Other Natural Area (ONA) on the farm, according to the SRV (Addo) CBA Map (Skowno and Holness, 2012).	6.11
Figure 6.3	Critical Biodiversity Area (CBA), Ecological Support Area (ESA), Other Natural Area (ONA) and No Natural Area Remaining (NNR) relative to the proposed pipeline route, according to the SRV (Addo) CBA Map (Skowno and Holness, 2012).	6.11
Figure 6.4	Critical Biodiversity Area (CBA), Ecological Support Area (ESA), Other Natural Area (ONA) and No Natural Area Remaining (NNR) delineated in the N40E quaternary catchment by the SRV (Addo) CBA Map (Skowno and Holness, 2012).	6.12

Figure 6.5	Land cover mapped for this assessment showing some discrepancy with the CBA and ESA status indicated on the SRV / Addo CBA Map. The reversibly modified areas in the CBA category should be ESA, while those in the 500m 'buffer area' are likely to be Other Natural Area or No Natural Area Remaining (but with vegetation cover).	6.13
Figure 6.6	The Eastern Cape Biodiversity Conservation Plan (ECBCP) classifies the proposed cultivation area as an ecological corridor (CBA T2), with only a few small areas indicated as urban and degraded (Berliner and Desmet, 2007).	6.15
Figure 6.7	The proposed pipeline route relative to the ECBCP CBA Map. Most of the route is mapped as cultivated lands (Berliner and Desmet, 2007).	6.16
Figure 6.8	Map indicating the Maputoland-Pondoland-Albany Hotspot (MPAH) Albany Corridor and Greater Addo Complex key biodiversity areas.	6.18
Figure 6.9	The SA Vegetation Map shows Sundays Thicket (brown) and Coega Bontveld (blue) within the proposed citrus area (pre-transformation).	6.21
Figure 6.10	The SA Vegetation Map maps Albany Alluvial Vegetation (green) and Sundays Thicket (brown) along the proposed pipeline route (pre-transformation).	6.21
Figure 6.11	Map indicating the four STEP vegetation units on Farm 653 (pre-modification levels) (Vlok and Euston-Brown), i.e. Sundays Valley Thicket (SVT), Koedoeskloof Karroid Thicket (KKT), Sundays Spekboom Thicket (SST) and Grassridge Bontveld (GB).	6.23
Figure 6.12	Map indicating the STEP vegetation units along the proposed pipeline route (pre-modification levels) (Vlok and Euston-Brown, 2002), namely Sundays Doringveld (green), and Sundays Spekboomveld (brown). The riparian or floodplain area (purple) is a non-Thicket/ non-STEP unit.	6.24
Figure 6.13	Vegetation Map for Farm 653, as mapped for this assessment.	6.28
Figure 6.14	Land cover map, with vegetation types, indicating level of degradation, modification (which includes transformed access tracks which have <b>not</b> been digitized), and near-natural areas that are moderately degraded.	6.40
Figure 6.15	Vegetation Sensitivity Map for Farm 653. (Note: The access tracks were classed as irreversibly modified/ transformed, but were not digitized for this assessment).	6.42
Figure 6.16	Map indicating biodiversity no-go areas, other no-go areas that extend beyond the biodiversity no-go areas (white dots) and the agricultural go areas (transparent).	6.46
Figure 6.17	Map indicating the vegetation types that fall within the final no-go areas and which will be retained post development.	6.47
Figure 7.17	Map indicating 1:50 000 topographical aquatic features relative to the proposed agricultural area (2012 Aerial Imagery).	7.12
Figure 7.18	The National Freshwater Ecosystem Priority Areas Map does not indicate the non-perennial river, Sundays River and the associated catchments to be a priority (Nel et al., 2011) and maps one dam to the west of the farm (2008 Satellite imagery).	7.13
Figure 7.19	The National Freshwater Ecosystem Priority Areas Map indicates wetland habitat at the Sundays River crossing and within 32m of the proposed pipeline route along the MR00470.	7.14
Figure 7.20	The Eastern Cape Biodiversity Conservation Plan classifies the associated sub-quaternary catchments as aquatic CBA 2a. The ECBCP land cover (2000) overlaid, showing cultivated areas, degraded and urban areas, which are not CBA (Berliner and Desmet, 2007).	7.16
Figure 7.21	The proposed pipeline route relative to aquatic CBA 2a that are the near natural areas. The ECBCP land cover (2000) overlaid, showing cultivated areas, degraded and urban areas, which are not CBA (Berliner and Desmet, 2007).	7.16
Figure 7.22	Map indicating land cover in the <b>quaternary</b> catchment N40E (Skowno and Holness, 2012). The ECBCP degradation layer: Small southern portion of catchment beyond the SRVM.	7.18
Figure 7.23	Map indicating land cover in the <b>sub-quaternary</b> catchments (Skowno and Holness, 2012). The ECBCP degradation layer: Small south-western portion of catchment beyond the SRVM.	7.19
Figure 7.24	Map indicating the wetland habitat on Farm 653 and within the 500m radius, including the non-perennial stream and drainage areas.	7.21
Figure 7.25	Map indicating the proposed pipeline route, the Sundays River crossing and irrigation dams with wetland habitat.	7.22
Figure 7.26	Recommended aquatic buffers, 100m and 20m.	7.46
Figure 7.27	Recommended biodiversity no-go areas (red) and other agricultural no go areas (white dots) on Farm 653.	7.47

Figure 8.1	Locality Plan.	8.3
Figure 8.2	Proposed Assess Configuration.	8.6
Figure 10.1	Proposed development areas (red – Farm 653; and yellow – pipeline route), using a portion of 1:50 000 scale topographic 3325 BC Coerney and 3325 DA Addo mapping.	10.2
Figure 10.2	Aerial view of the study area.	10.3
Figure 10.3	The study area is a combination of predominantly densely vegetated, undulating terrain.	10.5
Figure 10.4	The study area forms part of the Algoa Basin, which is represented by a succession of sediments of the Late Jurassic to Cretaceous Uitenhage Group. The Uitenhage Group in the map extract is represented by a diverse sediment fill, comprising the Kirkwood Formation (J.Kk) and overlying Sundays River Formation (Ks), capped by Quaternary Alluvium, surface calcretes, hillwash and residual soils. The study area is underlain marine and estuarine sediments of the Sundays River Farm (Ks).	10.6
Figure 10.5	Sundays River Formation sediments, exposed cliffs bounding the Sundays River, looking north.	10.7
Figure 10.6	Weathered Sundays River Formation siltstones, capped by brown, sandy topsoils (A); thick, sandy alluvium with calcrete nodules (B); overlying a calcretised pebbly gravel (C); and a reworked core within superficial sandy soil (D). Scale 1 = 10cm.	10.8
Figure 10.7	The study area is capped by well exposed, thick orange-brown sandy soils, hillwash and poorly sorted reworked gravels.	10.8
Figure 10.8	Uncapped Middle Stone Age stone tool (quartzite) artefacts in secondary context, within reworked and downwashed gravels. Scale 1 = 10cm.	10.9
Figure 10.9	Modern farm structures and existing dam, looking southwest.	10.10
Figure 10.10	Modern graveyard.	10.11
Figure 10.11	The irrigation pipeline route from the northeast boundary of Farm 653 (top left), to the Sundays River (bottom right).	10.12
Figure 10.12	Common Sundays River Formation invertebrates – ammonites (a, b), bivalves (c, d, & f) and oysters (e).	10.13
Figure 11.1	Drawing no. IL/2017-18/RS/01.	11.9
Figure 11.2	Drawing no. IL/2017-18/WL/01.	11.10
Figure 11.3	Drawing no. IL/2017-18/WT/01.	11.11
Figure 11.4	Drawing no. IL/2017-18/DT/01.	11.12
Figure 12.1	Landscape baseline map with land cover, relief, man-made structures and settlement patterns.	12.7
Figure 12.2	Topographic profiles along lines shown on the landscape map above: a) West to East. b) North to South.	12.8
Figure 12.3	Cumulative viewshed calculated for activities and structures surrounding the boundary of Farm 653/ Ikamva Lethu development (yellow outline), during construction.	12.13
Figure 12.4	Cumulative viewshed calculated for activities and structures along the proposed pipeline route, during construction.	12.14
Figure 12.5	Visual exposure for sensitive visual receptors within 10km of the proposed Ikamva Lethu development site.	12.17
Figure 12.6	Visual exposure for sensitive visual receptors within 5km of the proposed pipeline route.	12.18
Figure 12.7	Location of sites from which landscape photographs were taken.	12.20
Figure 12.8	View south from ILVP02, showing orchards and wind breaks among thicket and bush.	12.21
Figure 12.9	View south from ILVP03, showing the existing landscape that is likely to be transformed to cultivated lands and orchards.	12.21
Figure 12.10	Existing structures and buildings that will be adapted for use by the Ikamva Lethu development.	12.22
Figure 12.11	View south along the MR00470, showing farmsteads, a dam under construction or maintenance and power lines as elements of the game farm landscape, south of the Ikamva Lethu development site.	12.22
Figure 12.12	An entrance to a game farm (ILVP06) with construction activities taking place.	12.22
Figure 12.13	View north from ILVP08, showing the thicket landscape of the region.	12.22
Figure 12.14	View south from ILVP08, showing wind turbines.	12.23
Figure 12.15	View south, from a 4m high hunting tower (ILVP13), towards the boundary between Mr. V.d. Westhuizen's game farm and the Ikamva Lethu development site. A wind turbine can be seen on the horizon (yellow outline).	12.23
Figure 12.16	View north, towards the Sundays River Valley, from the hunting tower at ILVP13. Cultivated land and large structures associated with citrus farming can be seen in this view, as well as the settlement of Kirkwood in the background.	12.23



Figure 12.17	View north east, from the hunting tower (ILVP13), showing cultivated lands and settlements in the background.	12.24
Figure 12.18	View north, from the hunting lodge at ILVP10, showing the Sundays River Valley citrus orchards and developments. A hunting tower can also be seen towards centre left of the photograph (yellow outline).	12.24
Figure 12.19	View west, from GSV01 towards the proposed pipeline route, showing high trees of wind breaks (Source: Google Streetview).	12.24
Figure 12.20	View north, along pipeline route from R336 crossing (GSV02) (Source: Google Streetview).	12.25
Figure 12.21	Map showing visual sensitivity of the Ikamva Lethu development site. Red areas indicate highly visible areas while blue areas are less visible from the surrounding landscape.	12.32
Figure 13.1	Eastern Cape annual rhino poaching statistics.	13.2
Figure 13.2	Google earth aerial image depicting natural buffer zones at a farm in the vicinity.	13.5
Figure 13.3	A similar, buffer zone visible on the western fence line of Mr. van der Westhuizen's property.	13.5

## APPENDICES

APPENDIX A	Project EAP CV
APPENDIX B	Correspondence with DEDEAT
APPENDIX C	Specialist Declarations
APPENDIX D	Project Databases
APPENDIX E	Correspondence to I&APs
APPENDIX F	Correspondence from I&APs
APPENDIX G	Supporting Documentation
APPENDIX H	Layout Plan

## ABBREVIATIONS

CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CSR	Consultation Scoping Report
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	National Department of Environmental Affairs
DEDEAT	Provincial Department of Economic Development, Environmental Affairs and Tourism
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECBCP	Eastern Cape Biodiversity Conservation Plan
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
ESA	Ecologically Sensitive Area
FEPAs	Freshwater Ecosystems Priority Areas
FSR	Final Scoping Report
I&AP	Interested and Affected Party
LSRWUA	Lower Sundays River Water Users Association
NBA	Nation Biodiversity Assessment (2011)
NEMA	National Environmental Management Act (Act 107 of 1998), as amended
NEMAA	National Environmental Management Amendment Act (Act 107 of 1998)
NFEPAs	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act (Act 25 of 1999)
NMBM	Nelson Mandela Bay Municipality
NPAES	National Protected Areas Expansion Strategy
PES	Present Ecological State
PoS	Plan of Study
SABIF	South African Biodiversity Information Facility
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
STEP	Subtropical Thicket Ecosystem Project
S24G	Section 24G Assessment
ToR	Terms of Reference