

CHAPTER FOURTEEN: CONCLUSIONS AND RECOMMENDATIONS

14.1 INTRODUCTION

As per section 3. (1) I of Appendix 3 of the NEMA EIA Regulations, 2014 (as amended) this section of the report provides an environmental impact statement which contains a summary of the key findings of the environmental impact assessment including:

- *“a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives”*
- *“recording of proposed impact management outcomes for the development for inclusion in conditions of authorization”*
- *“any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorization”*
- *“a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorization”*

This section presents the conclusion on the most significant impacts identified through the EIA Process, together with management actions required to avoid or mitigate the negative impacts; or to enhance the positive benefits.

The assessment of impacts is presented in the following sections:

- Ecology – potential impacts on vegetation, biodiversity patterns and processes, as well as fauna (Chapter Six)
- Aquatic – potential impacts on aquatic resources within the development footprint, as well as within a 500m radius (Chapter Seven)
- Traffic – potential impacts on condition and operation of the roads in the vicinity, as well as suitability of the proposed access point (Chapter Nine)
- Heritage – potential impacts on heritage resources (Chapters Ten (Palaeontological) and Eleven (Archaeological))
- Visual – the intensity of potential visual impacts on sensitive viewers (Chapter Thirteen)
- Assessment of Alternatives (Chapter Five)

The monitoring of impacts is outlined in the Draft Environmental Management Programme (EMPr) included as Part B of this report. 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:
 - Potential project related impacts on natural vegetation and faunal habitat on the farm.
 - The consideration of any potential impacts on the Addo Elephant National Park and other areas in proximity to the proposed development area set aside for conservation purposes.
 - An aquatic survey to identify and map wetlands and watercourses on the farm.
 - Assign suitable buffers for aquatic resources identified on the farm.
 - Provide comment on the potential impact of the proposed development on Aquatic and Terrestrial CBAs, as identified in the ECBCP.
 - The determination of suitable buffers associated with meeting biodiversity conservation targets specific to the vegetation types on the farm, and in line with those targets indicated by the relevant planning frameworks for the area.
- The undertaking of a Phase 1 Palaeontological and Phase 1 Archaeological 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 proposed access point 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 and maize, to inform the proposed layout.
- A Visual Impact Assessment to determine the visual impact of the proposed agricultural development on the surrounding area, including the Addo Elephant National Park.
- The undertaking of a Roads and Wet Services Report to determine the footprint of the logistical services area including the pre-sort packhouse and staff housing as well as recommendations for the provision of bulk services (domestic water, stormwater, effluent management) for these facilities.

14.2 IMPACTS ON ECOLOGY AND RECOMMENDED MITIGATORY MEASURES

The anticipated clearing of vegetation (~516ha) for the proposed agricultural development (Chapter Two) on Scheepers Vlakte Farm will result in the clearing of predominantly natural to near-natural Sundays Spekboom Thicket, as well as some degraded and already modified vegetation. The loss of vegetation and subsequent faunal habitat will be greatest where intact vegetation is present.

Approximately 67.28ha (7.9%) 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. Past clearing for cultivation and livestock grazing has resulted in severe degradation and modification in the valley areas (north of the Scheepersvlakte Dam and along the main north-south drainage line), which represent the grassy Asteraceae shrubland Thicket mosaic (i.e. severely degraded to modified Sundays Doringveld or Sundays (Spekboom) Thicket). The overflow from the Scheepersvlakte Dam has also resulted in the formation of artificial wetland habitat, not evident in the historical imagery.

Opuntia ficus-indica and *Opuntia aurantiaca* are present on the farm, particularly where access tracks occur and past clearing took place, and thus their distribution is not uniform. The level of infestation is not considered high (>60% cover) relative to indigenous vegetation cover, however it has resulted in degradation, with localized patches. According to Kruger and Sykes (Unknown), low to moderate densities encompass (a) more than 2 canopy diameters apart (<25% coverage) or (b) 0.1 to 2 canopy diameters apart (25% - 75%). The natural to near-natural areas therefore include these alien invasive plants. *O. ficus-indica* and *O. aurantiaca* are common alien invasive plants of the region.

Notwithstanding the above, vegetation in the less dense areas does provide important faunal habitat, as dense thicket tends to exclude many faunal species. A fauna and flora search and rescue operation must be conducted before and during vegetation clearing activities. Relevant permits will also be required before search and rescue can commence.

14.2.1 Impacts and Management of Ecology

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

- Loss of vegetation and associated habitat due to clearing (biodiversity loss).
- Loss of Critical Biodiversity Area and Ecological Support Area due to clearing of vegetation (biodiversity loss).
- Loss of floral and faunal species of conservation/ special concern due to vegetation clearing and poaching (biodiversity loss).
- Fragmentation and destruction of habitat on Scheepersvlakte Farm due to clearing (biodiversity loss).

- Potential loss of artificial wetland habitat and drainage systems (vegetation along the 1:50 000 drainage areas) (hydrological processes and biodiversity loss).
- Loss and fragmentation of drainage systems (vegetation along the 1:50 000 drainage areas) due to crossings and associated increase in run-off (hydrological processes and biodiversity loss).
- Potential hydrological process impacts on artificial wetland habitat and drainage systems due to increased surface run-off from orchards and associated access roads (erosion, sedimentation, saturation and consequent impacts on biota).
- Potential hydrological process impacts on drainage systems (vegetation along the 1:50 000 drainage areas) due to crossings and associated increase in run-off (hydrological processes and biodiversity loss).
- Potential increased water levels/ saturation in the artificial wetland habitats and drainage systems due to irrigation (hydrological processes).
- Water quality degradation of the artificial wetland habitat and drainage systems due to agricultural run-off high in pollutants (hydrological processes and biodiversity loss).
- Loss of vegetation along drainage areas due to maintenance repairs on the underground water supply pipelines and access roads at crossings (hydrological processes and biodiversity loss).

Potential Cumulative Impacts on the N40D catchment as a result of the proposed development include:

- Cumulative loss of vegetation due to clearing in the N40D catchments (biodiversity loss).
- Potential cumulative loss species of special concern due to clearing in the N40D catchment (biodiversity loss).
- Cumulative loss of riparian CBA and ESA buffers due to clearing of vegetation in the N40D catchments (biodiversity and hydrological process loss)
- Cumulative loss and modification of wetland habitat in the N40D catchments.
- Cumulative impacts on hydrological process of rivers and riparian areas in the N40D 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.

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). which allows for a reduced loss of vegetation.
- Retain all the mapped Sundays Doringveld within the No-Go areas.
- The biodiversity No-Go Areas should be set aside for conservation in perpetuity.
- Remove only the required amount of vegetation for citrus/ crop cultivation activities i.e. minimize the extent of bare and exposed soils i.e. indiscriminate clearing should be avoided.
- If windbreaks are required, plant indigenous windbreaks, if possible.
- Existing crossings (across drainage areas) should be utilized as far as possible. In instances where vegetation is cleared to 'formalize' existing and new crossings, rehabilitation should be undertaken using indigenous flora.
- For all roads proposed within biodiversity No-Go areas, limit the width of the road to 4m.
- For any new roads within biodiversity No-Go areas, rehabilitate the equivalent number and length of existing roads within biodiversity No-Go Areas (this equates to an area of approximately 0.3ha or 0.4ha for a 4m or 6m wide road respectively).
- Rehabilitation of disturbed areas post-establishment with indigenous species, if necessary. Plants, however, can be used in the 'rehabilitation' of other disturbed areas that will be retained in the No-Go areas on the Farm. Succulents, such as the Aloes, will be easier to transplant and should be used.

- Rescue and translocation programme to be implemented.
- As many of the species should be rescued and then translocated elsewhere on the farm, noting that other areas outside the proposed agricultural area do support most of these species. It should be acknowledged that some of the species are weedy, pioneer species, which establish easily where disturbance has occurred, especially *Mesembryanthemum aitonis*, *Drosanthemum hispidum*, and *Delosperma* species. Focus should thus be on the Aloes, bulbs and other vygies.
- Permit applications to the Department of Economic Development, Environmental Affairs and Tourism for the protected species.
- Permit application to the Department of Forestry (of Department of Agriculture, Forestry and Fisheries) for the removal of *Sideroxylon inerme* trees.
- Control and management of alien invasive plants, such as *Opuntia ficus-indica* and *O. aurantiaca*, particularly within the No-Go areas; to be viewed as an additional biodiversity offset measure.
- Audit reporting by the Environmental Control Officer during construction/ clearing of cultivation areas.
- Compliance with regulations pertaining to the Conservation of Agricultural Resources Act (43 of 1983), where applicable.
- Applicant/ Landowner/ Farm Manager to monitor strict compliance with the biodiversity no-go 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 67.28ha (7.9%) 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 evidence of bush pig and porcupine presence was noted. Livestock grazing (cattle, sheep and goats) and intensive cultivation were historically undertaken on the farm, however, the livestock grazing apparently terminated ~14 years ago, whereas cultivation occurred in the 1950's.

In addition, the wetland habitat associated with the aquatic habitats identified on the farm are 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.

- Search and rescue operations before and during the site preparation phase will decrease the impacts considerably.
- Provide fencing that is more permeable to smaller fauna, thus increasing movement through the Farm.
- No fauna encountered on site to be intentionally harmed.
- Implement regular inspections for signs of poaching / illegal harvesting activities on the Farm, e.g. wire snares. All poaching materials to be removed from the property.
- Access to No-Go areas to be restricted to authorised personnel only. Signage to this effect to be erected and a fine system implemented for personnel found to be trespassing.

Aquatic Features (artificial and natural)

No natural wetlands were recorded on the Farm.

The field survey concluded the presence of 14 artificial wetland habitats¹, including the Scheepersvlakte Dam, and a number of dry 1:50 000 drainage areas (Figure 7.4; Table 7.3). The drainage areas are not typical streams/ rivers, but rather 'undefined', meaning that they presented without channel morphology (bed or banks), for the most part. Furthermore, riparian obligates and a marginal or non-marginal zone is not supported in these drainage areas.

A small dam (no. 5) was also recorded. This dam (no. 5) did not present with soil mottling or gleying during the 2017 field survey, despite supporting wetland obligates during the 2014 field survey. Consequently, it was classed as a dam and *not* 'artificial wetland' (artificial wetland, in this instance, would mean 'a dam that supports artificial wetland') due to the lack of wetland soils.

The Scheepersvlakte Dam (constructed in 1990) has a side channel (ogee) overflow (40m long), with a concrete spillway. The relevance being, that it will channel excess stormwater run-off during rainfall periods onto the property thus potentially increasing soil moisture levels.

Wetlands

Natural wetland habitats were not recorded on site, only relatively small artificial wetland habitats (dams) and the Scheepersvlakte Dam (on the neighbouring property/ within the 500m radius). As per the National Wetland Classification System (NWCS), artificial wetlands are produced anthropogenically; and are not naturally occurring systems. In this instance, many are small livestock dams, which have encouraged the establishment of wetland plants and soils.

In summary, 14 artificial wetlands (including the Scheepersvlakte Dam) were delineated on the Farm and within the 500m radius.

Table 14.1 below provides a summary description of the artificial wetlands identified.

Table 14.1: Summary of artificial wetland habitat supported in dams.

NO	ARTIFICIAL WETLAND HABITAT	HYDRO-GEOMORPHIC WETLAND TYPE	CONNECTIVITY	HYDRO-PERIOD	WITHIN 500M RADIUS	POTENTIAL TO BE IMPACTED ON BY PROPOSED AGRICULTURAL ACTIVITIES
1	Small dams with artificial	Un-channelled Valley Bottom	Along 1:50 000 drainage line	Likely to be intermittent	Yes	Yes

¹ *The National Wetland Classification System (NWCS) classifies wetlands into natural and artificial wetlands. Artificial wetlands are produced anthropogenically; and are not naturally occurring. The NWCS defines a wetland as: an area of marsh, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed ten metres (Ollis et al, 2013; SANBI, 2009).*

NO	ARTIFICIAL WETLAND HABITAT	HYDRO-GEOMORPHIC WETLAND TYPE	CONNECTIVITY	HYDRO-PERIOD	WITHIN 500M RADIUS	POTENTIAL TO BE IMPACTED ON BY PROPOSED AGRICULTURAL ACTIVITIES
2	wetland habitat	Depression	Isolated, not on a 1:50 000 drainage line	based on limited wetland species supported but unknown (based on two site visits) i.e. temporary (not including dam no.5, which is not wetland habitat based on the soil condition)	Yes	Yes
3			Isolated, not on a 1:50 000 drainage line		Yes	Yes
4			Along 1:50 000 drainage line			
5	Small dam with wetland obligate plants (2014) but no mottling in soil profile (2017)	Not applicable – classified as a dam	Isolated, not on a 1:50 000 drainage line		Yes	Yes
6	Small dams with artificial wetland habitat	Un-channelled Valley Bottom Depression	Along 1:50 000 drainage line			
7			Isolated, not on a 1:50 000 drainage line		Yes	Yes
8			Along 1:50 000 drainage line		Yes	Yes
9			Along 1:50 000 drainage line		Yes	Yes
10		Depression (excavation)	Isolated, not on a 1:50 000 drainage line		Yes	Yes
11		Depression (excavation)	Isolated, not on a 1:50 000 drainage line		Yes	Yes
12		Un-channelled Valley Bottom Depression	Along 1:50 000 drainage line		Yes	Yes
13	Artificial wetland habitat, includes dam and overflow from Scheepersvlakte Dam	Un-channelled Valley Bottom Depression	Along 1:50 000 drainage line	Permanent due to supply/overflow from Scheepersvlakte Dam	Yes	Yes
14	Scheepersvlakte Dam - a storage dam with artificial wetland habitat	Not applicable - Storage dam	Isolated, not on a 1:50 000 drainage line	Permanent due to supply from the LSRWUA canal	Yes	Yes
					Yes	Yes
					Yes	Yes

The artificial wetlands, located on the Farm, are considered to be of *Low* ecological importance and sensitivity, whereas the hydro-functional importance is *Low to Very Low*.

1:50 000 Ephemeral Drainage Areas

- *The Main North-South 1:50 000 Drainage Area*

The main 1:50 000 drainage line, that transects the farm in a north-south direction, did not present as a defined watercourse channel, for the most part, but is a natural drainage area sited along the valley floor where surface water might drain during heavy rainfall periods and flood events (Figure 7.4). Small surface water pools are thus likely to collect in the small depressions / dams (excavated for past agricultural land use activities) during high rainfall periods, allowing for wetland plants to establish. The PES of main north-south drainage area is considered to be Largely Modified (Class D).

o *Remaining 1:50 000 Drainage Areas*

The remaining 1:50 000 drainage areas to the east of the Farm presented without channel morphology (bed and banks). As with the main north-south drainage area, small narrow 'erosion channels' are also likely to occur in sections along the drainage lines, which are scoured during high rainfall periods along steeper slopes. For example, the drainage line, immediately to the east of the main north-south drainage area, presented with such 'channels' where run-off would flow during storm events. A typical riparian band or riparian obligates were also not supported in these systems, which are commonly referred to as surface water run-off areas. These drainage areas generally occur along the lower-lying valley areas i.e. reflecting natural drainage patterns. In some of the drainage areas, clearing of vegetation has occurred. These are ephemeral in nature that probably present with very limited sheet flow/ run-off only during high rainfall events. The PES of the drainage area immediately to the east of the main north-south drainage area is considered to be Moderately Modified (Class C). The PES of the drainage areas to the far-east is considered to be Largely Natural (Class B).

Based on the ephemeral nature of these drainage areas, transformation (in some areas), the largely undefined character of the systems, and absence of riparian obligates, the ecological importance and sensitivity of the drainage systems is classed as *Low* (from an aquatic biota perspective).

The following mitigation and management is recommended to protect the aquatic resources on site:

- Adopt the recommended biodiversity No-Go areas including the 20m buffer around dams with artificial wetland habitat and the drainage areas.
 - o The 20m buffer will not apply to Dam no. 5 (not classified as an artificial wetland), as no rare, unique or threatened species or large populations are supported and it is not a natural wetland. The proposed orchard layout avoids this dam.
- Dam no. 5 (not classified as an artificial wetland) could act as a monitoring site, to monitor potential impacts e.g. increased water/saturation and pollution impacts.
- The remaining artificial wetlands (created due to the formation of small livestock dams), to act as monitoring sites, to monitor potential impacts e.g. increased water/saturation and pollution impacts.
- Where existing crossings are utilized and some vegetation is cleared to 'formalize' the access roads, rehabilitate these areas with indigenous flora on site. In addition, limit the width of these crossings to a maximum of 4m.
- Rehabilitate the equivalent number of existing crossings as new crossings within the biodiversity No-Go areas i.e. 3 existing crossings in the biodiversity No-Go areas should be rehabilitated.
- **A water use application to be processed** with the DWS in terms of Section 21(c) and 21(i) of the National Water Act, where **crossings** are proposed.
- **A water use application should not be required** in terms of Section 21(c) and 21(i) of the National Water Act, as it relates to the **orchards** as the orchards are beyond the mapped 1:50 000 drainage areas.
- Audit reporting by the Environmental Control Officer during establishment of citrus orchards and associated infrastructure.
- Compliance with regulations pertaining to the Conservation of Agricultural Resources Act (43 of 1983), which *does not permit cultivation within the flood area of a watercourse or within 10m horizontally outside the flood area of a watercourse.*
- Monitor the buffers and crossings during operations to ensure ongoing compliance.

- An agricultural stormwater and erosion control plan should be developed. This could include:
 - Infiltration swales or narrow linear and shallow trenches (within indigenous grasses or plants) along orchards to minimize impacts on the dams with artificial wetland habitat.
 - Where existing crossings of the drainage areas occur, adequate measures should be implemented, where necessary.
 - Mulching, to increase retention of soil moisture in-situ/ at tree; and if feasible, narrow, indigenous vegetation strips between orchards.
 - Any other mitigation measures for the Scheepersvlakte Dam, as required by the Department of Water and Sanitation, should be adopted.

14.2.2 Summary and Additional Recommendations

The proposed agricultural development is not deemed to be a fatal flaw on condition that the recommended no-go areas, as indicated in Chapter Six (and the proposed layout in Appendix H)), are adopted and *all* the recommended mitigation measures implemented. This will ensure that the biodiversity pattern target area for Sundays (Spekboom) Thicket, ecological process areas and the hydrological process areas associated with the 1: 50 000 drainage areas and artificial wetlands, shall be safeguarded. In addition, Sundays Doringveld will not be cleared, albeit in a largely degraded state.

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

Table 14.2: Key direct and indirect ecological impacts (Medium to High Negative pre-mitigation only).

ENVIRONMENTAL IMPACT	DEVELOPMENT PHASE	PRE-MITIGATION	POST-MITIGATION
Loss of vegetation due to clearing	Establishment	(Sundays Doringveld) HIGH	(Albany Alluvial Veg) NEUTRAL
		(Sundays Spekboom Thicket) HIGH	(Sundays Spekboom Thicket) MEDIUM
Loss of Critical Biodiversity Area and Ecological Support Area due to clearing	Establishment	HIGH	NEUTRAL
Loss of species of conservation/special concern due to clearing	Establishment	(Least Concern) MEDIUM	LOW
		(Vulnerable) HIGH	
Fragmentation of habitat due to clearing	Establishment	HIGH	MEDIUM
Potential loss of artificial wetland habitat and drainage systems (vegetation along the 1:50 000 drainage areas) (hydrological processes and biodiversity loss)	Establishment	(Main North-South Drainage Area and Artificial Wetlands) HIGH	NEUTRAL
		(Eastern Drainage Areas) MEDIUM	VERY LOW
Loss and fragmentation of drainage systems (vegetation along the 1:50 000 drainage areas) due to crossings and associated increase in run-off (hydrological processes and biodiversity loss)	Establishment	(Main North-South Drainage Area and Artificial Wetlands) MEDIUM	LOW
		(Eastern Drainage Areas) MEDIUM	LOW

Potential hydrological process impacts on artificial wetland habitat and drainage systems due to increased surface run-off from orchard areas and associated access roads (erosion, sedimentation, saturation and biota impacts)	Establishment	(Main North-South Drainage Area and Artificial Wetlands) MEDIUM	VERY LOW
Potential hydrological process impacts on artificial wetland habitat and drainage systems due to increased surface run-off from orchard areas and associated access roads (erosion, sedimentation, saturation and biota impacts)	Operational	(Main North-South Drainage Area and Artificial Wetlands) MEDIUM (Eastern Drainage Areas) MEDIUM	VERY LOW
Potential hydrological impacts on drainage systems (vegetation along the 1:50 000 drainage areas) due to crossings and associated increase in run-off (hydrological processes and biodiversity loss)	Operational	MEDIUM	LOW
Potential increased water levels/ saturation in the artificial wetland habitats and drainage systems due to irrigation (hydrological processes)	Operational	(Main North-South Drainage Area and Artificial Wetlands) MEDIUM	LOW
Water quality degradation of the artificial wetland habitat and drainage systems due to agricultural run-off high in pollutants (hydrological processes and biodiversity loss)	Operational	(Main North-South Drainage Area and Artificial Wetlands) HIGH	LOW
Loss of faunal Species of Special Concern due to vegetation clearing	Establishment	MEDIUM	LOW
Destruction of faunal habitat	Establishment and Operational	HIGH	MEDIUM
Loss of faunal Species of Special Concern due to poaching	Establishment and Operational	MEDIUM	LOW
CUMULATIVE IMPACTS			
Potential cumulative loss of vegetation due to clearing	Establishment	HIGH	MEDIUM
Potential cumulative loss of CBA and ESA due to clearing of vegetation	Establishment	MEDIUM	LOW
Potential cumulative loss of species of special concern due to clearing of vegetation	Establishment	MEDIUM	LOW
Cumulative loss and modification of wetland habitat in the larger catchments	Establishment	HIGH	MEDIUM
Cumulative impacts on hydrological process of watercourse and riparian areas in the N40E catchments (flow, water quality, erosion, sedimentation etc.)	Operational	HIGH	LOW

It is recommended that the following are included as conditions in the Environmental Authorisation:

- No-go areas for development (including aquatic and ecological buffer areas) must be demarcated on site before vegetation clearing commences.
- Any lay-down areas must be contained within the proposed disturbance area and may not encroach on any no-go areas on the site.
- Before site clearing commences, the development area must be surveyed for plant and faunal SSC by a suitably qualified specialist. Plant and faunal species of special concern must be translocated to the remaining patches of intact vegetation or buffer areas on the property. Permits must be obtained from the relevant authorities for the removal or transfer of protected flora and faunal species.
- No fauna encountered on site to be intentionally harmed.
- Exotic plants present on the site, which are listed in CARA (Conservation of Agricultural Resources Act 43 of 1983) or the NEMBA Alien Invasive Species List should be progressively removed from the site. In addition, regular follow-up clearing should be conducted for the duration of the project lifetime to ensure that the No-go areas are kept free of these plants.

14.3 HERITAGE IMPACTS AND RECOMMENDATIONS

14.3.1 Geological Background

The study area on Farm Scheepers Vlakke 7/ 98, is characterised by gently hilly terrain between ~100-180 m amsl. on the northern side of the Sundays River Valley, ~13km northwest of Addo. The foothills of the Suurberge Range here are clothed in dense, often impenetrable Sundays River subtropical Thicket vegetation, with local grassy areas and patches of bossieveld. Drainage lines are shallow and not incised while natural bedrock exposure is minimal.

The geology of the Addo area is shown on 1: 250 000 geological map 3324 Port Elizabeth (Council for Geoscience, Pretoria; Toerien & Hill 1989). The area lies towards the northern edge of the extensive Algoa Basin that is infilled with a 3.5km thick succession of alluvial fan, fluvial and estuarine to marine shelf sediments of Late Jurassic to Early Cretaceous age (~150-125Ma), that are referred to the Uitenhage Group (McLachlan & Anderson 1976, Shone 2006). The great majority of Farm Scheepers Vlakke 7/ 98 is underlain by marine sediments of the Sundays River Formation that are mapped as being overlain by (or interfingering with) fluvial sediments of the Kirkwood Formation along the northern margins of the property. Since the Kirkwood beds, if indeed present, are not encountered at surface here and are unlikely to be significantly impacted by the proposed development, they are not treated further here.

The Sundays River Formation is of Early Cretaceous (Valanginian-Hauterivian) age, i.e. around 136Ma (million years old). It comprises a thick (up to 2km) succession of thin-bedded grey sandstones, siltstones and finer-grained mudrocks that are often highly fossiliferous (Shone 2006). Depositional settings range from estuarine through littoral (shoreline) to marine outer shelf (McMillan 2003). These beds are differentiated from the older to contemporaneous Kirkwood Formation of the Uitenhage group by (a) the absence of reddish-hued mudrocks, (b) the presence of prominent-weathering calcareous sandstones, and (c) the frequent occurrence of fossil marine shells. These last are commonly, but not invariably, associated with the thin, calcareous sandstone beds, many of which are tempestites (i.e. storm deposits). Key geological accounts of the Sundays River Formation include those by Du Toit (1954), Rigassi & Dixon (1972), Winter (1973), McLachlan & McMillan (1976), Tankard et al. (1982), Dingle et al., (1983), McMillan (2003) and Shone (1976, 2006). For the study area the geological sheet explanations by Haughton (1928), Engelbrecht et al. (1962), Toerien and Hill (1989) and Le Roux (2000) are most relevant.

The only surface exposures of Sundays River beds encountered in the assessment area's vicinity include weathered grey-green mudrocks and khaki-green channel sandstones along the margins of an irrigation canal – outside the agricultural project area – as well as occasional low exposures of weathered sandstones in farm tracks.

Weathered Sundays River saprolite (in situ weathered bedrocks) is locally capped by 1-2m of creamy, glaebular, rubbly to pseudobedded and dense calcrete, as seen in borrow pits in the southwestern sector of the study area, as well as along its northeastern margins. The calcretes are often conglomeratic towards the base, with abundant rounded quartzite clasts and/ or angular blocks of Sundays River sandstone. They occur at elevations of 100m amsl and above and are probably of Pleistocene or older, Pliocene age. They do not, as far as observed, contain shelly remains such as thick-shelled oysters and are not considered to form part of the Miocene – Pliocene Alexandria Formation (Algoa Group), although this unit is mapped at similar latitudes to the northeast of Addo. The calcretes are overlain by brown soils with abundant gravels of calcrete rubble plus quartzitic pebbles and cobbles. The pebbly deposits may locally infill solution hollows incised into the top of the underlying hardpan.

In the higher-lying portions of the Farm Scheepers Vlakke 7/ 98 study area, the Cretaceous bedrocks are mantled with Late Tertiary (Neogene) to Quaternary fluvial gravels ("High Level Gravels"). The gravels originally covered extensive, river-cut pediment surfaces at an elevation of ~100-170m amsl that have been dissected by subsequent stream incision. These surfaces form part of a series of terrace deposits of Miocene to Holocene age bordering the Sundays River that have been grouped into the Kudus Kloof Formation by Hattingh (1994, 2001). The type of area for this formation is situated due south of the present study area, ~4km southwest of Sunland. According to the detailed map of Hattingh (2001, Appendix 2 and his Figure 3.4), the gravels on Farm Scheepers Vlakke 7/ 98 belong to Terraces 6 and 7 of inferred Late Pliocene age, through correlation with fossil-dated equivalent wave-cut terraces along the coast. Such older terrace deposits of the Kudus Kloof Formation are mainly composed of clast-supported, horizontally- and cross-bedded gravels interbedded by thinner packages of coarse sand. They are often well-consolidated due to secondary calcification (Hattingh 1994, 2001, Partridge et al. 2006). A detailed description of, and profile through, a 4.5 m-thick succession of Terrace 7 gravels overlying Sundays River mudrocks at Kudus Kloof, ~5km west of Sunland, is given by Hattingh (2001, his Figure. 4.3b).

The bedrocks over most of the lower-lying parts of the study area are mantled in thick, gravelly, sandy to silty soils of orange-brown to brown colour with dispersed gravels of quartzite and calcrete, as seen in excavations from numerous test pits along farm tracks. Downwasted, well-rounded quartzite cobbles and pebbles are common on the surface – for example around the margins of the Scheepersvlakte Dam (not part of this assessment). Patches of thick (few meters), intensely orange-hued sands with dispersed quartzite gravels overlying calcrete might be relicts of a more extensive cover by Plio-Pleistocene aeolianites of the Nanaga Formation (See Almond 2010). Local rubbly oligomict diamictites containing an admixture of Sundays River sandstone blocks, quartzite pebbles and calcrete clasts might be slope deposits (debrites) or artificial in origin.

14.3.2 Palaeontological Results and Findings

The study area on the Farm Scheepers Vlakke 7/ 98, ~13km northwest of Addo in the Sundays River Valley, Eastern Cape, is largely underlain by Early Cretaceous marine sediments of the Sundays River Formation (Uitenhage Group). This mudrock-dominated succession with subordinate sandstones has yielded rich fossil assemblages of marine invertebrates (notably molluscs, such as ammonites and bivalves), plant remains (e.g. driftwood), as well as very rare vertebrate remains (e.g. dinosaurs) from the Algoa Basin of the Eastern Cape. Several fossil localities have been recorded along the flanks of the Sundays River Valley to the west of Addo by McLachlan and Anderson (1976) and earlier authors. However, on Farm Scheepers Vlakke 7/ 98, the Sundays River Formation is largely mantled by Neogene (Late Tertiary) river gravels of the Kudus Kloof Formation, as well as by calcrete hardpans and thick alluvial soils that may be up to several meters thick and are, at most, very sparsely fossiliferous. Continental sediments of the Early Cretaceous Kirkwood Formation are mapped along the northern margin of the study area but were not encountered during fieldwork, perhaps due to lack of exposure.

14.3.3 Archaeological Results and Findings

It proved difficult to locate archaeological sites/ materials since most of the area is covered by dense/ impenetrable Thicket vegetation, low bushes and grass. Stone stools were the only archaeological material located and were mainly observed in areas where the river gravel is exposed and top soil has been disturbed by existing tracks, dams or other small-scale farming activities. Regardless of the large areas investigated on foot, no other remains such as bone,

ostrich eggshell or pottery were observed. However, it is possible that sites/ materials are covered by vegetation and soil.

The most common stone tools observed throughout the area were of Middle Stone Age (MSA) origin, but occasional Earlier Stone Age (ESA) tools were also observed (dating between 1,5 million and 30 000 years old) (Figure 11.3, bottom insert). These stone tools are located in the reddish top soil and in the river gravels which cover the slopes overlooking the Sundays River, located ~2km to the south of the area under assessment. Most of the Middle Stone Age stone tools were thick, small 'informal' flakes (with typical faceted striking platforms), cores and chunks with few of other typical MSA tool types such as 'true' points and blades. The tools are manufactured on quartzite and observed randomly without any recognized distribution patterns. The Earlier Stone Age (dating between 1,5 million and 250 000 years old) stone tools comprised mainly of heavy flaked cobbles and occasional small hand axes. Large numbers of these stone tools were located in a series of spring deposits at Amanzi Spring near Uitenhage (~20km south of the study area). Hand axes have also been observed along the banks of the Sundays River. Although the property is near the Sundays River, no freshwater shell middens/ materials were observed (see discussion below).

*All the stone tools were in secondary context and not associated with any other archaeological material and of **low cultural significance**. No further action is required. There are no known graves or buildings older than 60 years on the property. In general, it would appear that the area is of **low cultural sensitivity** and that it is unlikely that any sensitive archaeological remains will be exposed during the development.*

14.3.4 Impacts and Management of Heritage Resources

Significant impacts on fossil heritage resources are, therefore, not anticipated here. No fossil remains were recorded during the site visit within the Cretaceous bedrocks, which are minimally exposed in this region, or from the Late Caenozoic superficial sediments.

The main impact on archaeological sites/ remains (if any) will be the physical disturbance of the material and its context. The clearing of vegetation for the proposed agricultural development (~516ha) will expose, disturb and displace archaeological sites/ material. However, from the investigation it would appear that the proposed area earmarked for development is of *low archaeological sensitivity*. The Middle Stone Age stone tools observed in the proposed area to be developed are considered to be of *low cultural significance*, because they are in secondary context and not associated with any other archaeological remains. Notwithstanding, important materials may be covered by soil and vegetation.

The following actions are recommended:

- No further Palaeontological Specialist Studies or specialist mitigation are required for the proposed agricultural project, pending the discovery or exposure of any substantial fossil remains (e.g. vertebrate bones and teeth, large blocks of petrified wood, fossil plant-rich horizons, buried laminated shales) during the construction phase.
- The ECO responsible for these developments should be alerted to the possibility of important fossil remains and concentrations of archaeological materials and/ or human remains being found either on the surface or exposed by fresh excavations during construction.
- The manager/ foreman should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. It is suggested that a person be trained (ECO) to be on site to report to the site manager if sites are found.

- An archaeologist should conduct a walkthrough of the area after the vegetation has been cleared, to check if any significant sites/ materials have been exposed. Further recommendations will follow after the investigation.
- Should such heritage resources be discovered during construction, these should be safeguarded (preferably *in situ*) and the ECO should alert the Eastern Cape Provincial Heritage Resources Authority (ECPHRA. Contact details: Mr Sello Mokhanya, 74 Alexander Road, King Williams Town 5600; Email: smokhanya@ecphra.org.za). This is so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional palaeontologist (See tabulated Chance Fossil Finds Procedure appended to the EMPr). The specialist involved would require a collection permit from ECPHRA. Fossil material must be curated in an approved repository (e.g. museum or university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA (2013).
- Sufficient time should be allowed to investigate and to remove/ collect such material.
- Recommendations will follow from the investigation.

14.4 TRAFFIC IMPACTS AND RECOMMENDATIONS

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

- Access to the proposed development can be provided directly from MN50077 at the location indicated (see Chapter Nine) as sight distances are in excess of the prescribed minimum requirements;
- A total of 944 trips over the 95 weekday picking season (472 in and 472 out), generated at full operational capacity (20 trips per day), will have minimal impact on the operational capacity of the adjacent road network, should regular maintenance be conducted.

Table 14.3 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:

Table 14.3: Key direct and indirect traffic impacts (Medium to High Negative pre-mitigation only).

ENVIRONMENTAL IMPACT	DEVELOPMENT PHASE	PRE-MITIGATION	POST-MITIGATION
Additional traffic volumes	Establishment	MEDIUM	LOW
Traffic Safety Impact due to slow moving traffic	Establishment	HIGH	MEDIUM
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 Transport;
- Access to the proposed development be provided from MN50077, as indicated on Figure 9.2;
- Suitable warning signage be erected on the approaches to the proposed access point;
- Advanced warning signage be erected on either side of the narrow culvert on DR01983;
- Regular maintenance of DR01983/ MN50077 be conducted by the provincial Department of Transport.

14.5 VISUAL IMPACTS AND RECOMMENDATIONS

The proposed development covers a large area of land but is **not visible** from any main roads, towns or from within the Addo Elephant National Park, even though it is located within 15km of all these receptors. The only visual points that will have visibility of the proposed development are Viewpoints V2 (located on the farm; full visibility) and V10 (partial visibility from the Park main gate), all located within 3km of the farm. None of the other identified viewpoints will have visibility (partial or complete)

of the proposed development, as they all will be screened by existing vegetation and topography. Depending on the view point, the overall visibility and sensitivity may vary from LOW to MODERATE. None of the points were regarded as having a HIGH significance.

Overall, the impact for all viewpoints are regarded as:

- **LOW**, where the impact should not have an influence on the decision.

The assessment of these impacts was undertaken in terms of the following visual assessment criteria:

- Visibility of the project;
- Visual exposure;
- Visual sensitivity of the area;
- Visual sensitivity of receptors;
- Visual absorption capacity; and
- Visual intrusion.

The following receptors were identified:

- Scheepers Vlake Farm.
- Town of Sunland.
- Town of Addo.
- Town of Enon.
- Town of Bontrug.
- Addo Elephant National Park.
- R336 Road users.
- R335 Road users.
- R342 Road users.
- DR02006 Road users.
- DR01983 Road users.

Only 2 of the identified receptors will have visibility of the proposed new site namely:

- Scheepersvlakte Farm (full visibility).
- R342 Road users (section past the Addo Elephant National Park entrance; partial visibility).

In assessing the direct impacts to visual resources, it has been recognized that, although the lifespan of the project is likely to extend into perpetuity, most of the structures can be removed on decommissioning. This means that although the proposed facility will undoubtedly have an impact on the visual resources of the area, it does not represent a completely irreversible loss of scenic resources.

The following impacts were identified:

- A change in character and loss of cultural scenic resources of the local area is not anticipated, as the proposed development will not significantly alter the scenic value of the local area. Agricultural developments, especially to the west of the site are extensive, therefore, the visual impact is local in nature.
- Road users, especially those using the R342 to access the Addo Elephant National Park, will not be impacted by the proposed development.
- The impact of existing agricultural developments in the local area on visitors within the Addo Elephant National Park, is already significant and adding the proposed development will not have a significant impact on the existing scenic value from viewpoints within the Park as it is likely to blend in with the already largely agricultural nature of the area. In addition, due to topography it has been established that the development will not be visible at the two viewpoints visited within the Park and should therefore not detract from the "wilderness experience" of visitors to the Park.

- The construction phase (when natural vegetation is cleared for agriculture) is recognized as significant and will result in visual scarring. The impact is temporary and of medium term, if mitigated (planted with citrus orchards).

14.5.1 Mitigation Measures

The following mitigation measures are recommended:

- Lighting:
 - LSA and other permanent structures should, where practical, be situated off ridgelines so as to minimise the view catchment of the lighting, especially during nighttime;
 - All lighting should be fitted with deflectors to avoid light spillage and minimise visual impact of lights at night. The developer should specifically plan the type, placement and direction of lighting to ensure that light pollution is minimized, especially toward the east.
 - Timer switches or motion detectors should be used to control lighting in areas that are not occupied continuously.
- Visual Intrusion in the Landscape:
 - Possible vegetation screening along sections of the DR01983 road, as well as the DR02006 (Enon road), which is frequented by impacted individuals.

14.5.2 Concluding Statement

The proposed development will undoubtedly be imposing on the visual landscape for those in close proximity, especially during the site clearing/ construction phase. However,

- Based on the assessment of significance in this report;
- Given that the logistical support structures are removable on decommissioning;
- Given certain mitigation recommendations in this report;
- Given an understanding that although there are local losses, there are also other local, regional and national environmental, social and economic gains; and
- Given authentic efforts to ensure certain benefits accrue to those in close proximity to the development;

It is concluded that potential losses of scenic resources are not sufficiently significant to present a fatal flaw to the proposed project.

14.6 LOGISTICAL SERVICES AREA DESIGN AND RENOVATIONS RECOMMENDATIONS

A new logistical services area is proposed to be constructed near the southern boundary of the farm in order to provide administrative and logistical support for the development. The proposed logistical services area will measure ~6ha in extent and is proposed to consist of the following support infrastructure/ structures:

- Pre-sort packhouse (~6500 m²).
- Tractor/ trailer off-loading and receiving slab.
- Dispatch truck loading slab.
- Access road (~8m wide) including turning circles (~36m diameter).
- Workshop and storage area (300m²).
- Office/ administration area (150m²).
- Other staff facilities including ablution blocks (150m²).
- Staff housing (5 x 60m²).
- Onsite domestic effluent treatment system (e.g. Clearedge system) (641m²).
- Domestic water storage and treatment facilities (1 575m²).
- Stormwater detention facilities (2 260m²).

A Roads and Wet Services Report has been prepared in order to ensure that the proposed logistical services area and proposed staff housing are adequately serviced. The report is included as Chapter Twelve of this report and provides detailed information on the above services infrastructure.

14.6.1 Roads

Access to the Farm is proposed via an ~6m wide private road onto the gravel MN50077 road, ~4km east of the surfaced DR01983 road; and which crosses a portion of the LSRWUA canal (via an existing bridge) on the southern boundary of the Farm. This existing access road is proposed to be upgraded and widened (~8m wide) to service the proposed agricultural development. A right of way servitude will need to be registered over the adjacent property in order to ensure access to the development in perpetuity. The internal radii of the circulation areas around and near the pre-sort packhouse shall preferably be 18m or wider, as far as practically possible, to accommodate the effective flow of heavy vehicle traffic.

Integral to the internal operations within the proposed agricultural development, are a number of new internal service roads. These internal service roads are anticipated to vary in width between 4m and 6m. It is anticipated the main internal roads will be provided with a gravel wearing course, while the vehicle tracks amongst the individual orchards will remain unpaved. All internal roads will be designed and constructed to accommodate stormwater runoff, e.g. avoid steep gradients, stormwater cut-off/ diversion berms, and judicious use of erosion protection measures.

14.6.2 Stormwater

- In order to reduce the volume of stormwater, intercept stormwater from the roofed areas and convey it to rainwater storage tanks near the buildings. The surplus stormwater from the roofs will be conveyed by means of the proposed storm water system to the aforementioned detention ponds. It is recommended to install a 5 000L tank at each staff house and 18 x 10 000L tanks next to the pre-sort packhouse.
- Intercept and convey the stormwater from all the open hardstand areas associated with the logistical services area and convey it to the storm water detention ponds, as far as practically possible.
- Subject to the detailed design of earthworks, operational areas/ roads and the stormwater system, the formed surface areas on and near the logistical services area shall be designed to also act as shallow stormwater channels under minor storms and emergency overland flow routes during or after major storm conditions, where necessary.

14.6.3 Water

The Average Daily Demand (ADD) of personnel at the logistical services area during the packing season per working day will be 39 000L/ day (**39m³ per day**). The annual average daily demand during the packing season will be 30.2m³ per calendar day and 906m³ per calendar month. Treated canal irrigation water will serve as the primary source of domestic water. The applicant will be liable to treat the raw water on site to the required standards in order to be able to utilize the water for drinking purposes and domestic use. The following water reticulation, treatment and storage system is, therefore, proposed:

- Water will be pumped from the 140 000m³ new irrigation dam, to a dual chamber reservoir (effective storage capacity of 350kl (350m³), via a 63mm diameter HDPE pumping main.
- Reservoir will be designed to also act as a sedimentation facility.

- Water treatment plant with a capacity of 60kl to be designed and constructed, subject to the outcome of the test results on the raw irrigation water, to consist of a screen filter, sedimentation facility, filter system, chlorinator and storage tanks combined with a booster pump system.
- One should be able to accommodate the on-site water treatment plant including the 350m³ reservoir on a total footprint of 35m x 45m (1 575m²), depending on the type of storage reservoir.
- The main internal reticulation will mainly consist of a 110mm diameter PVC-U Class 12 piped connection to the site and a looped reticulation mainly consisting of 110mm diameter PVC-U pipelines Class 12.

Roof rainwater can act as a secondary domestic water supply subject to effective disinfectant treatment where necessary. It is recommended to install a 5 000L tank at each staff house and 18 x 10 000L tanks next to the pre-sort packhouse, which is proposed to have a roof area of 6500m².

14.6.4 Domestic Effluent System

The Average Dry Weather Flow (ADWF) of the logistical services area on the farm has been calculated to be **25.1m³ per working day** for the 330 factory workers (165 workers working a double shift) and 24 permanent personnel during the packing season. The preferred option to treat the domestic effluent under post-development conditions is the Clearedge Sewage Onsite Treatment System or similar foul sewer treatment system, as approved by the Sundays River Valley Municipality. The treatment plant will have a daily throughput capacity of 25.1m³. The location to construct the foul sewer treatment plant is proposed to be ~200m west of the pre-sort packhouse. The following components will form part of the proposed foul sewer treatment system:

- Three chamber communal septic tank (26m³).
- Pump station.
- Treatment plant (200m²) consisting of:
 - Balancing tank
 - Bio-reactors
 - Clarifier
 - Contact Tank
- Maturation pond (441m² /377m³).
- Emergency pumping main.

Gravity sewers (160mm) will convey effluent to the communal septic tank. Effluent will then be pumped via a 110mm pipe to the treatment plant (balancing tank). Most of the bigger suspended solids will be contained and be broken down by anaerobic and aerobic action in the first chamber of the “communal” septic tank. The clearer effluent overflow from the third chamber will be pumped to the bioreactors. The sewage effluent will move through the media where aerobic bacteria in a submerged fixed-film will break down the organic matter to more stable levels with the addition of air (higher concentration of dissolved oxygen) supply under pressure.

The treated overflow from the bioreactor(s) will be discharged to the clarifier(s) where the sludge will be settled out, drained and be returned to the first chamber of the “communal” septic tank. The clear treated effluent from the top part in the clarifier will be conveyed to the chlorine contact tank to disinfect the clear treated effluent. The treated effluent will thereafter be directed to the maturation pond.

However, it is also recommended to design and construct a maturation pond which will also act as an *irrigation/ emergency retention ponding* system at the foul sewer batch plant. The irrigation/ emergency retention pond has to be designed and constructed to allow a minimum of 4 days

retention time to ensure the *final effluent is free from any chlorine residual*, which could occur under isolated overdosing conditions. In case of extreme unforeseen package plant breakdowns, it is recommended that the irrigation/ emergency retention pond system be designed to accommodate the inflow up to **15 days x ADWF** that can be re-circulated to the “communal” septic tank to limit the risk of possible contamination of underground water sources. It is also recommended to supply the batch plant with a mobile independent diesel generator in case of power failures.

The grassed embankment areas which will be irrigated with the treated effluent, is more than 11 400m² (1.1ha) in extent.

14.6.5 Chemical Store

The proposed workshop and storage area will include a fully enclosed bunded, roofed facility with a capacity to store ~30m³ of chemicals required for the proposed agricultural development. Storage and handling of chemicals on site must comply with standard Material Safety Data Sheet control measures. It is recommended that any waste packaging must be disposed of at a suitably permitted landfill site and not buried or burnt on site.

In addition, it is proposed that an outdoor aboveground diesel tank, with the capacity to store ~14000L/ 14m³ of fuel, be constructed adjacent to the workshop area. In order to mitigate any potential risks associated with the fuel tank, due consideration must be given to appropriate design and construction. The tanks are required to be built to industry standard in order to be Global G.A.P. compliant.

Recommendations regarding the specifications for the fuel tank as well as the design and management of the chemical storeroom have been included in Chapter Two and Appendix G, respectively, of this report.

14.7 ASSESSMENT OF ALTERNATIVES

The following alternatives were identified for consideration in this assessment:

- No-Go alternative
- Property/ Location alternatives
- Land-Use alternatives
 - Grazing/ game
 - Crop cultivation and citrus orchard establishment
- Layout alternatives (development footprints)
- Alternatives as Raised by I&APs and Authorities
 - Tourism
 - Access Alternative
 - Buffers

The preferred alternatives from the list above as contemplated in detail in Chapter Five are summarized below.

14.7.1 No-Go Option

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

R185 million. The operational phase of the project will result in the creation of 200 permanent employment opportunities with an annual income of approximately R13.5 million and 1000 seasonal employment opportunities with an additional annual income of R31.4 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.

14.7.2 Property/ Location Alternatives

Regarding the content of the Scoping Report, Appendix 2, Section 2 (1) (g) (x) requires that, if an alternative is not considered, the reasoning/ motivation for such is provided. In line with this regulation the following reasoning was provided for not including the assessment of property alternatives in the approved Scoping Report, however, layout development footprints have been considered, as contained in section 5.5 below.

Reasoning/ Motivation for the Elimination of an Alternative

As indicated in the first paragraph of this chapter, Chapter One of the EIA Regulations 2014 (as amended), provides for the interpretation and purpose of the regulations, including, amongst others the assessment of alternatives, which may include the property or location upon which an activity is proposed to take place. This should not be confused with layout/ development footprint alternatives within a specific site, which will be included in this assessment process (see section 5.5 below). As a baseline, the No-Go alternative will be assessed.

The Remainder of Portion 7 of Farm 98, known as Scheepers Vlakte Farm, is owned by the applicant, Scheepersvlakte Farms (Pty) Ltd and is currently zoned Agriculture I. The majority of properties surrounding the Farm are currently engaged in some form of commercial agricultural activity including citrus orchards, commercial chicken production and livestock/ game grazing (see Map 3.2). The Farm has not been previously modified for commercial agriculture. Approximately 0.5% of the Farm has been modified by quarrying, as well as the existing structures on site. Therefore, ~99% (~848ha) of the Farm is currently in a near-natural state. The area assessed includes the quarried site, as well as the location of the existing farm structures, and measures ~852ha in extent. The area to be cleared has been informed by the various specialist assessments through the assessment process.

Prior to commencing with the Scoping and EIA Process the project applicant, Scheepersvlakte Farms (Pty) Ltd, applied for and was granted a Water Use Licence from DWS for the taking of water from a water resource in terms of section 21 (a) of the National Water Act which entitles them to utilise 650ha (5 850 000m³ per annum) of water from the LSRWUA canal system. The aforementioned licence is issued in respect of a particular property (i.e. Remainder of Portion 7 of Farm 98). Since water is a crucial requirement for the proposed agricultural development, it is not deemed feasible to assess other property alternatives.

Based on the experience of the EAP, land available for cultivation, which is situated adjacent to existing agricultural areas and which is zoned for agricultural use, have existing water use rights, suitable soils, and is near the LSRWUA canal system, is becoming increasingly scarce in the Sundays River Valley. Scheepers Vlakte Farm meets the abovementioned requirements and thus

no other reasonable or feasible property/ location alternatives are proposed to be assessed. Layout/ development footprint alternatives within the Farm, however, have been assessed.

14.7.3 Land Use Alternatives: Crop Cultivation and Citrus Orchard Establishment

As outlined in Chapter One of this report, the area under assessment is located in the SRVM and is zoned Agriculture I. In terms of the Section 8 Zoning Scheme Regulations this “*means the cultivation of land for crops and plants or the breeding of animals, or the operation of a game farm on an extensive basis on the natural veld or land, and includes only such activities and buildings as are reasonably connected with the main farming activities of the farm, but does not include the consent uses applicable to agriculture zone 1.*”

Scheepers Vlakte Farm is not currently under cultivation. However, the applicant has been allocated 650ha of water rights by the Department of Water and Sanitation (5 850 000m³ per annum) and water for the proposed development will be sourced from the Lower Sundays River Water Users Association (LSRWUA) canal system. Pivot irrigation is proposed to supply water to the crops (e.g. maize), whilst micro/ drip irrigation is proposed to supply water to the citrus orchards.

Scheepers Vlakte Farm is located in a predominantly agricultural area, as indicated by the surrounding land uses adjacent to the Farm (See Map 3.2 in Chapter Three). The majority of properties surrounding the Farm are currently engaged in some form of commercial agricultural activity, including citrus orchards, commercial chicken production and livestock/ game grazing. However, some properties adjacent to the north, east and western boundaries indicate the presence of near-natural vegetation. The northern boundary of the Farm is adjacent to the Enon Mission Station communal land, showing signs of livestock grazing. Based on the surrounding land uses, the proposed agricultural development on Scheepers Vlakte Farm is not likely to cause a significant change in character within the surrounding landscape, as the surrounding area is currently predominantly agricultural in nature.

Some of the key elements contributing to the sustainability of the agricultural potential of the Farm is access to arable land, suitable soils, the topography of the site and the availability of water. Based on the experience of the independent EAP in the area, access to such land in the Sundays River Valley, which meet the abovementioned requirements, is becoming increasingly scarce. The reason being that, suitable land with sufficient access to water is already being utilized for commercial citrus and crop production. Potentially suitable land parcels do not always have ready access to canal water from the LSRWUA. As a result of the distance to water, development often requires a larger capital investment, to ensure a reliable irrigation water supply. At present, Scheepers Vlakte Farm meets the abovementioned criteria and is, therefore, considered to have a high agricultural potential and is potentially suitable for the proposed development.

The proposed agricultural development on the Farm will create several temporary construction phase, as well as permanent, operational and seasonal employment opportunities. In addition to the direct employment opportunities related to the farming operations, a number of indirect jobs will also be created by the proposed development, particularly within the packaging and logistics industries, amongst others. 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 26% in terms of the Water Use License.

It is proposed that for Phase 1 of the project, only ~150ha of citrus (lemons and late mandarins) be planted along with ~100ha maize (total 250ha). Thereafter, citrus will only be planted once maize has first been cultivated for ~1–2 years. This process will continue for ~2–5 years, until ultimately the entire farm is planted with citrus. The planting of maize will be done in order to prepare the soil for the establishment of citrus, whilst simultaneously eliminating a potentially harmful root system fungus which is prone to attacking a specific citrus variety. The maize produced during the ~5-year period will be for the local market (e.g. cattle fodder and human consumption). The citrus to be produced will be for both local and international markets, as well as for juicing. International markets generate income from foreign currency, thus, contributing to local economic growth. Some of the citrus produced will, also be sold locally to vendors or juicing factories which will assist in stimulating local markets.

For the reasons outlined above **this is the preferred alternative**, which has been assessed in detail during the EIA phase of the assessment, and which includes preferred layout/ development footprint alternatives within the preferred site. Chapter Four of this report provides an overview of the methodology for the identification, rating and assessment of impacts (both positive and negative) and the specialist studies undertaken during the EIA phase of the assessment.

14.7.4 Layout Alternatives

The EIA phase of the assessment has assessed layout/ development footprint, alternatives on Scheepers Vlakte Farm, based on the detailed specialist studies, as well as technical input.

Specialist studies which formed part of this assessment are:

- Soil Suitability – potential of soils for the establishment of citrus orchards and annual crops (maize)
- Slope Analysis – slopes in excess of 25% are not suitable
- Vegetation – species of special concern, ecological corridors, conservation targets
- Aquatic – aquatic sensitivity and associated buffer zones
- Irrigation efficiency and requirements – drip and pivot irrigation
- Heritage features – including Archaeological and Paleontological features on the farm
- Traffic Impact – additional trip generation and access to the farm
- Visual – impact on sensitive receptors in the immediate landscape
- Roads and Wet Services – recommendations regarding domestic water, effluent management, and stormwater management for the logistical services area

The final layout (preferred development footprint within the site) for the project has been determined by the specialists and technical input in the EIA phase of the assessment, as well as public consultation and proposes to clear total of ~516ha to accommodate the proposed agricultural development, including associated infrastructure (See Chapter Two).

The Alternative 2 layout is based on the specialist input which has been provided through the Environmental Assessment Process, in particular, soil suitability, slope analysis and ecological constraints. The preferred layout has identified an area of ~272ha (No-Go) which is unsuitable for the proposed development. These areas are therefore proposed to be set aside for conservation and will facilitate the maintenance of ecological patterns and processes within the site and with intact natural areas on adjacent farms.

In addition, the proposed balancing dam (~140 000m³) has been resized, due to the reduction of the development size and has been located outside of the drainage line and associated buffer area

so as to not interrupt the hydrology of the water resources on the farm. The proposed access point has been moved eastwards from where it was originally proposed, based on issues raised through the public consultation process, and thus the logistical services area has also been relocated to adjacent to the southern boundary of the farm to be closer to the proposed access point.

14.7.5 Alternatives as Raised by I&APs and Authorities: Alternative Access

Sunriver Citrus cc, an adjacent landowner has brought to the attention of the EAP, through the Public Participation Process, that the access route which was initially proposed is a servitude registered in favour of the Department of Water Affairs. In addition, that road has not been designed to handle the traffic anticipated to be create by the development. Based on the input from this I&AP and in consultation with the proposed traffic specialist, an alternative access route to the site has been identified and has been assessed in the EIA Phase of this assessment. The Traffic Specialist has indicated that this existing access road is suitably placed to allow sufficient shoulder site distances and that the surrounding road network will be able to handle the additional trip generation as a result of the development. However, in order to provide access to heavy vehicles this existing access road is proposed to be upgraded and widened (~8m wide). In addition, a right of way servitude will need to be registered over the adjacent property in order to ensure access to the development in perpetuity.

14.7.6 Alternatives as Raised by I&APs and Authorities: Buffers

Buffers on a property can serve, inter alia, the following purposes:

- To maintain a visual barrier (sense of place) between the property under development and adjacent landowners
- To maintain a visual barrier for sensitive visual receptors (National Parks) further afield
- To maintain ecological corridors (patterns and processes) with intact vegetation types on adjacent properties

Based on the findings of the Visual Impact Assessment (Chapter Thirteen) buffers to provide visual screening is not deemed necessary for the proposed development. This is because the proposed development is not visible from any of the sensitive visual receptors within close proximity to the Farm. Further away from the farm the proposed development is anticipated to blend into the surrounding agricultural landscape. In addition, due to the scale of the development and the topography of the site, visual screening, for example by vegetation, is not deemed to provide a suitable visual barrier from individuals in the immediate vicinity. Buffers are therefore not considered suitable alternatives to visual intrusion of the development.

The Lower Sundays River Water Users Association (LSRWUA) canal is situated along the southern boundary of Scheepers Vlakte Farm. In addition, the farms adjacent to this southern boundary have been completely transformed for agriculture (citrus and commercial livestock grazing). The Thicket (assumed based on Google Earth aerial imagery) on the farm adjacent to the western boundary has been severely degraded due to numerous cutlines and paths that have been made into the indigenous vegetation. This has potentially reduced the conservation value of this farm, given this and the fact that it is surrounded by existing agricultural development as well as its close proximity to the canal, this farm has the potential for a change in land use to agriculture. Therefore, buffers between the proposed orchards and the southern and western boundaries of the farm are not likely to provide any biodiversity value or contribute significantly towards connectivity within the broader landscape.

The current proposed layout has excluded the majority of the indigenous Thicket vegetation, adjacent to the eastern boundary of the site, from the proposed development footprint. This excluded “buffer” area varies in widths ranging from ~15m to 340m. These retained areas of natural vegetation will ensure connectivity and conservation of ecological patterns, processes and corridors with the indigenous vegetation which has been retained on the farm adjacent to the eastern boundary of Scheepers Vlakte Farm (Hopefield, Farm 713)². These “buffer”, or No-Go areas, have been determined based on specialist input, including ecological and aquatic constraints, soil suitability and slope.

The drainage line which bisects the farm in a north-south direction and associated Sundays Doringveld vegetation has been excluded from the proposed development footprint. In addition, two other drainage lines located in the eastern portion of the farm, and also following a north-south direction have been provided with buffers (20m) and excluded from the proposed development footprint. These No-Go areas, along with portions of the farm that have been excluded due to steep slopes and unsuitable soils have provided a comprehensive network of corridors for the maintenance of ecological patterns and processes within the farm and with intact natural areas on adjacent farms. The buffers proposed on the preferred layout alternative are considered reasonable and feasible in order to maintain ecological links within the property and surrounding landscape versus a buffer between the orchards and the boundary of the property. However, as indicated above buffers are proposed on portions of the northern, eastern, southern and western boundaries of the property as per the various specialist recommendations.

For more detail regarding the alternatives that were not considered further in the assessment process due to them not being preferred, see Chapter Five of this report. For more detail on the preferred alternative assessed in detail in this assessment process, see Chapter Two of this report.

14.8 PERMIT REQUIREMENTS

Permission will be required from the provincial environmental authorities for the clearance of vegetation and removal of plant species protected by the relevant legislation.

- Permits from the relevant authority (Department of Economic Development Environmental Affairs and Tourism) are required for the removal, translocation or destruction of all plants and animals listed as endangered or protected in terms of the Cape Nature and Provincial Conservation Ordinance (No. 19 of 1974), as well as those listed as Threatened or Protected Species in terms of NEMBA.
- The Department of Water and Sanitation (DWS) will be required to provide feedback on the requirement for a water use application in terms of Section 21 (b), (c) and (i) of the National Water Act.
- The Traffic Impact Assessment is to be submitted to the Eastern Cape Department of Roads and Public Works of the Eastern Cape for approval prior to commencement of the construction phase.

14.9 OVERALL EVALUATION OF IMPACTS

The Final Integrated Development Plan for the SRVM (SRVM IDP 2015/ 2016), indicates that the current unemployment rate in the municipal area may be as high as 38.54%. The Agricultural sector provides room for growth in terms of employment opportunities, as it currently represents approximately 11% of the employment for the SRVM area. Additionally, the SRVM IDP (2015/ 2016; Page 36) states that: *“The municipality can boast its ecotourism and agricultural potential.”*

² Please note that this portion of Farm 713 (Hopefield) has been rezoned as Private Open Space III as per a condition in an Environmental Authorisation issued to the landowner (DEDEAT Authorisation No: EC06/C/LN1&3/M/21-2013) and is therefore anticipated to remain in its present state in perpetuity.

Finally, the following statement is given by the SRVM Spatial Development Framework (SRVM SDF 2013; Page 8): *“The agricultural sector is one of the key economic drivers of the Sundays River Valley Municipality.”*

It is the applicant’s intention to build on this economic base in the SRVM, by making optimum use of the available resources the area has to offer, i.e. the availability of a sustainable supply of irrigation water from the LSRWUA canal system, the suitability/ fertility of the soils on Scheepers Vlakte Farm, as well as the available work force from local communities. By making use of this labour market, the proposed development would also support the vision of the Sundays River Valley Local Economic Strategy, as outlined in the SRVM SDF (2013), which indicates agriculture as a Local Economic Development Priority and identifies the need to *“...expand the agricultural section in the region.”*, as an Economic Development Objective.

Scheepersvlakte Farms (Pty) Ltd is a citrus farming business initiated by Sun Citrus (represented by Cecil Brummer), B Muller Family Trust (represented by Boetie Muller) and Hansie Klein Kinders Trust (represented by Hansie van der Westhuizen). The philosophy at Sun Citrus has always been that the Human Resources are the most important asset for the business. Since 2000 Sun Citrus has invested in their staff through training and education. However, Sun Citrus is now close to reaching its maximum size as an organization. As such, it is beginning to impose a “ceiling” both on the further development of individuals who have already risen through the ranks, and on those who are still to rise through the ranks of the company. Sun Citrus have, therefore, identified the need to create empowerment opportunities beyond the fruit packing, and farming business.

The Ukukhanya Business Trust was founded as a means/ business opportunity to further empower the employees of Sun Citrus, not only for the benefit of financial growth but also for personal growth and exposure to bigger business opportunities. For this reason, the proposed agricultural development of the Remainder of Portion 7 of the Farm Scheepers Vlakte 98 has been identified as an opportunity for staff from these entities to continue their growth and economic empowerment, while building on their already extensive knowledge of the citrus industry.

Scheepersvlakte Farms (Pty) Ltd is made up of the following entities:

- Ukukhanya Business Trust (26%) – comprising of existing Sun Citrus employees
- Sun Citrus Holdings (24.67%)
- B Muller Family Trust (24.67%)
- Hansie Klein Kinders Trust (24.67%)

Seven Beneficiaries of the Ukukhanya Business Trust have already been identified. These seven beneficiaries will be the key players in the development of the project. Should the proposed development receive Environmental Authorisation, a further 600 employees will benefit from the development. It is also envisaged that in future the Trust will have the option to increase its shareholding in Scheepersvlakte Farms (Pty) Ltd. This will be made possible by utilizing a portion of their dividends to purchase such shareholding at a price to be determined by the auditors from time to time. Such dividends will be forthcoming from the 10th year of operation of the project.

Should the proposed agricultural development receive Environmental Authorisation it will allow greater opportunities for existing staff to move to better positions, for example:

- Seven positions at senior levels will be vacated in the packhouse’s (Sun Citrus) organizational structure: These positions are all to be filled by currently employed individuals who are within the junior ranks in the business. Each of these individuals will receive the necessary mentoring

and training to prepare for these changes, building further on their development and empowerment progress as individuals and exposing them to new challenges and opportunities.

- As positions are vacated to fill the higher positions, so places will be made available for seasonal employees to become permanent employees and for new people, previously not employed by the entities to find employment within the entities. As a result, they too will indirectly become beneficiaries of the proposed development.

Upon completion of construction and during the operational phase of the development, it is estimated that 200 new permanent employment opportunities will be created at a value of ~R13.5 million annually, and 1000 seasonal opportunities at an annual value of ~R31.4 million. Labour will be sourced locally from communities in the SRVM and Nelson Mandela Bay Municipality (NMBM).

Based on the outcome of the detailed specialist assessments, technical input and consultation process, it is proposed that ~516ha (~61% of the extent of the property) be cleared in order to facilitate the establishment of ~468ha of citrus, as well as associated infrastructure. This will include the construction of a new irrigation dam (~7ha), as well as roads, windbreaks, lay down areas and a new logistical services area (~6ha) including a pre-sort packhouse.

The additional clearance of ~516ha will result in ~29% of the near-natural and degraded vegetation on the farm 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 (of 17%). In addition, the Sundays Doringveld on the Farm has been excluded from the development footprint.

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.