Hendrina Ash Disposal Facility Expansion: Avifaunal Specialist Assessment of the Amendment to the Power Line Re-routing Alternatives

Addendum to the Original Avifaunal Report (EWT, 2011)

On behalf of

Lidwala Consulting Engineers

5th September 2014

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Approved By	Jennifer Slack	4 September 2014

SPECIALISTS' DECLARATION OF INDEPENDENCE AND QUALIFICATIONS

Arcus are independent and have no business, financial or personal, in the activity, application or appeal in respect of which it was appointed, other than fair remuneration for work carried out. There are no circumstances that compromise the objectivity of their specialists performing such work.

Andrew Pearson is an Avifauna Specialist at Arcus and has a Four Year BSc in Conservation Ecology, certificates in Environmental Law, as well as six years' experience as an environmental management professional. The findings, results, observations, conclusions and recommendations given in this report are based on this author's best scientific and professional knowledge as well as available information. Andrew conducted the site visit and provided inputs to the species behaviour with regard to the analysis and interpretations of the avifauna data as an Avifauna Specialist. Andrew is a certified Professional Natural Scientist. The Natural Scientific Professions Act of 2003 aims to "Provide for the establishment of the South African Council of Natural Scientific Professions (SACNSP) and for the registration of professional, candidate and certified natural scientists; and to provide for matters connected therewith." Andrew is a professional member of the SACNSP, as detailed below:

Investigator:	Andrew Pearson (Pri.Sci.Nat)
Qualification:	BSc (hons) Conservation Ecology
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Fields of Expertise:	Ecological Science
Registration:	Professional Member

Andrew Pearson (5th September 2014)

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1 INTRODUCTION AND BACKGROUND

The Endangered Wildlife Trust (EWT) compiled a Specialist Avifaunal Impact Assessment Report (as part of the EIA) for the Hendrina Power Station Ash Disposal Facility Expansion Project, dated November 2011 (the 'EWT 2011 Report'). This report addressed two alternatives for the re-routing of existing power lines around the proposed expansion site (Alternative 1 and Alternative 2). Subsequently, and following discussions with land-owners, it is understood that an additional two alternative routes (Alternative 3 and Alternative 4) are being proposed, while Alternative 1 has been discarded. These additional route options require assessment from an avifaunal perspective.

Arcus were appointed by Lidwala Consulting Engineers ('Lidwala') to undertake the required assessment, as the original report author, Andrew Pearson, has moved from EWT to Arcus, and EWT no longer provide such avifaunal specialist services. A site visit was conducted on the 12th and 13th of August 2014 to enable the avifauna specialist to view the two additional proposed power line re-routing alternatives.

The route options are shown in **Appendix 5** of this report.

2 METHODOLOGY

The following was carried out in compiling this report:

- The EWT 2011 Report was reviewed;
- The 'Study site' is defined as the area covered by all site alternatives as well as a buffer of 1 km, while the 'Broader study area' is defined as the area up to 10 km from the edge of the Study site;
- During the site visit the specialist traversed (by foot and by vehicle) as much of the area within the Study site as possible, as well as observing the Broader study area;
- Five Co-ordinated Waterbird Count (CWAC) sites were visited and species were recorded;
- Bird microhabitats, both within the Study site and the Broader study area were assessed;
- All bird species observed were recorded during the site visit;
- The most recent South African Bird Atlas Project Two (SABAP2) data for the applicable pentads were considered;
- The potential impacts of the route options 3 and 4 were assessed as per the methods used in the EWT 2011 Report;
- Mitigation measures and recommendations are proposed; and
- An updated comparison of the all power line alternative corridors (2, 3 and 4) was conducted.

2.1 Survey Limitations and Assumptions

The following survey limitations and assumptions exist:

- The same limitations and assumptions stated in the EWT 2011 Report are applicable;
- In order to assess route options 3 and 4, only one site visit was conducted in late winter over which time various species may not have been present in the Broader study area or on the Study site. No long term monitoring or bird surveying was conducted, however the effort was deemed suitable for the nature of the project; and
- A walkthrough of each route was not conducted however due to the topography of the landscape the area of the route alternatives could be observed from a distance.

3 RESULTS

3.1 Microhabitats

Microhabitats were confirmed to be the same as those reported in the EWT 2011 Report, with no significant land use or vegetation changes being evident on the most recent site visit carried out by Arcus in August 2014. Thus, the most important micro-habitats for avifauna in the Broader study area still remain as per the EWT 2011 Report:

- Drainage lines and wetlands;
- Pans;
- Man-made dams;
- Open grassland; and
- Cultivated land and pasture.

All of the above micro-habitats are also present in the Study site.

3.2 Avifaunal Baseline Update

3.2.1 EWT 2011 Report Review

The EWT 2011 Report made the following key findings in terms of avifauna present, or potentially present, in and around the site:

- The South African Bird Atlas Project (SABAP) records 193 and 221 bird species in the study area, of which 16 are Red Listed (Barnes, 2000) Species (Harrison et al, 1997);
- Co-ordinated Avifaunal Roadcount (CAR) route number MM03 of the Mpumalanga Precinct runs in close proximity to the Study site. Southern Bald Ibis was the only key species recorded on this route during the study period;
- Key species recorded at two CWAC sites (Oranje Pan and Coetzeespruit Dam) include the Greater Flamingo and African Marsh-Harrier;
- The endangered (Barnes's, 2000) Botha's Lark has been recorded in the Important Bird Area (IBA) - Amersfoort-Bethal-Carolina District- a large area beginning approximately 16 km south east of the Study site.
- Lesser Kestrel; Amur Falcon; Lesser Flamingo and Greater Flamingo were the only relevant species recorded in the SABAP 2 data by the EWT 2011 Report.
- The most important species to be considered when doing the impact assessment, i.e. the focal species for the study, were determined to be the following: Greater Flamingo, Lesser Flamingo, Grey-crowned Crane, Denham's Bustard, Blue Korhaan, Southern Bald Ibis, and White Stork.

3.2.2 Southern African Bird Atlas Project 2

The latest SABAP-2 data (accessed on the 3rd September 2014) was examined for applicable pentads (which are roughly 8 km x 8 km squares, and are smaller than the squares used in SABAP-1) in the Study site.

Pentad 2600_2930 had been counted twice, with a total of 64 species recorded including Spotted Eagle-Owl, Marsh Owl, Lesser Flamingo, Greater Flamingo.

Pentad 2600_2935 had also been counted twice, with a total of 84 species recorded including White-backed Duck, White-winged Tern, and Whiskered Tern, Black-necked Grebe, Maccoa Duck, African Spoonbill and Greater flamingo.

Although not within the Study site, data from two additional pentads (2555_2930 and 2555_2935 which had been counted 7 and 4 times, respectively) were considered and revealed the occurrence of the following relevant species: Steppe Buzzard, Amur Falcon, Greater Flamingo, Lesser Flamingo, Lesser Kestrel, Marsh Owl, Fulvous Duck, Maccoa Duck,

African Jacana, African Black Duck, African Wattled Lapwing, Goliath Heron, Spur-winged Goose and Black-shouldered Kite.

3.2.3 Species Observations

A total of 46 species were recorded (Table 1) during the two day site visit, of which two species are Red Listed (Taylor, 2014). 19 species were observed in the Study site itself, including two which were only seen in the Study site. 44 species were observed in the Broader study area (17 of which were observed in the Study site). The most significant sightings included observations of flocks of Greater Flamingos in the Broader study area, as well as high numbers of waterfowl, particularly Maccoa Duck, Yellow-billed Duck, Red-knobbed Coot, Little Grebe, Cape Shoveler, Red-billed Teal and Egyptian Goose.

Table 1: List of Species Observed During the Site Visit to the Study Site and Within the Broader Study Area

Alphabetical Name	Scientific Name	Red List Status (Taylor,2014)	Study site	Broader Area
Canary, Black-throated	*Crithagra atrogularis*		X	X
Dove, Cape Turtle	*Streptopelia capicola*		X	X
Dove, Red-eyed	*Streptopelia semitorquata*		X	X
Egret, Western Cattle	*Bubulcus ibis*		X	X
Fiscal, Southern (Common)	*Lanius collaris*		X	X
Heron, Grey	*Ardea cinerea*		X	X
Ibis, Hadeda	*Bostrychia hagedash*		X	X
Kite, Black-shouldered	*Elanus caeruleus*		X	X
Lapwing, Crowned	*Vanellus coronatus*		X	X
Lark, Red-capped	*Calandrella cinerea*		X	X
Longclaw, Cape	*Macronyx capensis*		X	X
Pigeon, Speckled	*Columba guinea*		X	X
Pipit, African	*Anthus cinnamomeus*		X	X
Snipe, African	*Gallinago nigripennis*		X	X
Stonechat, African	*Saxicola torquatus*		X	X
Weaver, Southern Masked	*Ploceus velatus*		X	X
Wheatear, Capped	*Oenanthe pileata*		X	X
Bishop, Southern Red	*Euplectes orix*			X
Coot, Red-knobbed	*Fulica cristata*			X
Cormorant, Reed	*Phalacrocorax africanus*			X
Cormorant, White-breasted	*Phalacrocorax lucidus*			X
Duck, Knob-billed	*Sarkidiornis melanotos*			X
Duck, Maccoa	*Oxyura maccoa*	Near threatened		X
Duck, White-faced Whistling	*Dendrocygna viduata*			X
Duck, Yellow-billed	*Anas undulata*			X
Flamingo, Greater	*Phoenicopterus roseus*	Near threatened		X
Goose, Egyptian	*Alopochen aegyptiaca*			X
Goose, Spur-winged	*Plectropterus gambensis*			X
Grebe, Great Crested	*Podiceps cristatus*			X

Alphabetical Name	Scientific Name	Red List Status (Taylor,2014)	Study site	Broader Area
Grebe, Little	*Tachybaptus ruficollis*			X
Heron, Black-headed	*Ardea melanocephala*			X
Heron, Purple	*Ardea purpurea*			X
Ibis, Glossy	*Plegadis falcinellus*			X
Lapwing, Blacksmith	*Vanellus armatus*			X
Martin, Brown-throated	*Riparia paludicola*			X
Moorhen, Common	*Gallinula chloropus*			X
Quelea, Red-billed	*Quelea quelea*			X
Shoveler, Cape	*Anas smithii*			X
Sparrow, Cape	*Passer melanurus*			X
Spoonbill, African	*Platalea alba*			X
Stilt, Black-winged	*Himantopus himantopus*			X
Teal, Cape	*Anas capensis*			X
Teal, Red-billed	*Anas erythrorhyncha*			X
Wagtail, Cape	*Motacilla capensis*			X
Chat, Ant-eating	*Myrmecocichla formicivora*		X	
Lark, Pink-billed	*Spizocorys conirostris*		X	
TOTALS			19	44

Following the site visit and a review of the updated SABAP 2 data, the focal species list to be considered in the impact assessment was updated to the following species:

- Greater Flamingo;
- Lesser Flamingo;
- Maccoa Duck;
- Denham's Bustard;
- Blue Korhaan;
- Southern Bald Ibis;
- Lesser Kestrel;
- Grey Heron;
- Red-billed Teal;
- Marsh Owl; and
- White Stork.

3.3 Assessment of Potential Impacts

The nature of the potential impacts for all alternatives are the same and as such, they have only been described once in sections 3.3.1.1 and 3.3.1.2 and have not been repeated in sections 3.3.2.1 and 3.3.2.2. Sections 3.3.2.1 and 3.3.2.2 just provide a conclusion on the significance of the impacts.

Impacts have been assessed for their significance utilising a method supplied by Lidwala Consulting Engineers and shown in Appendix 6.

3.3.1 Alternative Corridor 3

3.3.1.1 Construction Phase Impacts (Appendix 1)

Habitat Destruction

During the construction phase of power lines some habitat destruction and alteration inevitably takes place. This can happen if there is construction of access tracks or roads, and with the clearing of servitudes. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the power line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimize the risk of fire under the line which can result in electrical flashovers. These activities have an impact on birds breeding, foraging and roosting in or in close proximity of the servitude through modification of habitat. Habitat destruction is anticipated to be of medium significance without mitigation for this alternative.

Disturbance

Similarly, the above mentioned construction and maintenance activities impact on birds through disturbance, particularly during bird breeding activities. Disturbance of birds is anticipated to be of medium significance for this alternative.

3.3.1.2 Operational Phase Impacts (Appendix 2)

Electrocution

Electrocution of birds on overhead power lines is an important cause of unnatural mortality of raptors and storks in particular (van Rooyen & Ledger, 1999). Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (van Rooyen, 2004). Electrocution is possible on 132 kV lines, depending on the exact pole structure used. For this study, it is assumed that a bird friendly structure will be used, and the detailed impact assessment below, is based on this assumption. Therefore, the impact of electrocution is likely to be of low significance for this alternative without mitigation.

Collision

A bird collision occurs when a bird in mid-flight does not see the overhead cables until it is too late to take evasive action (Smallie *et al*, 2009) .This results in the bird colliding with the cables, and usually dying through injuries related to the impact with the cable or the subsequent impact with the ground. Most heavily impacted upon are bustards, storks, cranes and various species of water birds. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines (van Rooyen, 2004; Anderson, 2001). Many of the collision sensitive species are considered threatened in southern Africa. The Red Listed species vulnerable to power line collisions are generally long living, slow reproducing species under natural conditions. Some require very specific conditions for breeding, resulting in very few successful breeding attempts, or breeding might be restricted to very small areas. These species have not evolved to cope with high adult mortality, with the results that consistent high adult mortality over an extensive period could have a serious effect on a population's ability to sustain itself in the long or even medium term. Many of the anthropogenic threats to these species are non-discriminatory as far as age is concerned (e.g. habitat destruction, disturbance and power lines) and therefore contribute to adult mortality, and it is not known what the cumulative effect of these impacts could be over the long term.

The impact of certain large flying bird species, such as Greater Flamingo, Lesser Flamingo, White Stork and Southern Bald Ibis, colliding with power lines associated with Alternative Corridor 3 is expected to be of medium significance without mitigation.

Disturbance

Routine maintenance of pylons and power lines could result in disturbance of certain bird species during the operational life span of the power line. This is especially true for breeding birds in the vicinity, as well as those that may roost or nest on the structures. This impact is expected to be of low significance.

3.3.2 Alternative Corridor 4

3.3.2.1 Construction Phase Impacts (Appendix 3)

Habitat Destruction

Habitat destruction impacts associated with Alternative Corridor 4 are anticipated to be of medium significance.

Disturbance

Disturbance impacts associated with Alternative Corridor 4 are anticipated to be of medium significance.

3.3.2.2 Operational Phase Impacts (Appendix 4)

Electrocution

Electrocution impacts associated with Alternative Corridor 4 are likely to be of low significance.

Collision

The impact of certain large flying bird species, such as Greater Flamingo, Lesser Flamingo, White Stork and Southern Bald Ibis, colliding with power lines associated with Alternative Corridor 4 is expected to be of medium significance.

Disturbance

Disturbance impacts associated with Alternative Corridor 4 are expected to be of low significance.

4 PROPOSED MITIGATION AND RECOMMENDATIONS

The following mitigation and recommendations are applicable to all the alternatives under consideration, the significance of all impacts were found to be the same for both alternatives both before and after mitigation.

Table 2 Mitigation and Recommendations

Impact	Significance before mitigation	Mitigation	Significance after mitigation
Construction Phase			
Habitat Destruction (Alternatives 3 and 4)	Medium	Adherence to construction EMP including the enforcement of no-go areas, access control of large plant and vehicles, as well as no off road driving.	Low
Disturbance (Alternatives 3 and 4)	Medium	Control of construction activities through adherence to EMP including the enforcement of no-go areas, access control of large plant and vehicles, as well as no off road driving;	Low

Impact	Significance before mitigation	Mitigation	Significance after mitigation
		Contact avifaunal specialist if nest/ breeding site of a focal species or red listed species is identified within 500 m of the power line; and Buffer with 300 m radius around abovementioned nest site to be declared a no-go area until avifaunal specialist has assessed the situation.	
Operational Phase			
Electrocution (Alternatives 3 and 4)	Low	Use steel monopole tower with standard bird perch; All clearances between live and earth components to be greater than 1.8 m; and All electrocutions to be reported to Eskom and EWT.	Low
Collision (Alternatives 3 and 4)	Medium	Mark all sections of overhead line within 200m of any pans or dams with appropriate marking devices ('bird flappers'); Report all collision incidents to Eskom and the EWT; and An "avifaunal walk through" or "desk top finalisation" when the chosen route is known and the tower positions have been fixed is recommended in order to identify the exact spans of line for marking to mitigate for bird collisions	Low
Disturbance	Low	No nests may be removed; If any of the "Focal Species" or red-listed species are observed to be roosting and/or breeding within 200 m of the power line corridor then an avifaunal specialist is to be contacted; and No off road driving and no un-authorised persons allowed on site.	Low

5 COMPARISON OF ALTERNATIVES

As stated above, the potential avifauna impacts of the alternative routes (3 and 4; Appendix 5) have been assessed. The EWT 2011 Report assessed alternatives 1 and 2 using the same method. A comparison of the alternatives assessment is presented in Table 3. All of the predicted impacts identified in Section 3.3 above, have been assessed for significance, as per the same set of criteria used in the original EWT 2011 Report (and shown in Appendix B of the EWT 2011 Report); the results of which are shown in Appendices 1 to 4. In order to rank the alternative route corridors shown in Appendix 5, Table 2 was compiled and the

alternatives given a rating on a scale of 0 to 10, with 0 being No Go, 1 being the least preferred and 10 being the most highly preferred (from an avifaunal perspective). The levels of preference were determined by the using the specialist's professional opinion, after consultation of the impact significance ratings of alternatives 1 and 2 from the EWT 2011 Report. Consideration of the assessment of impacts did not generate a different level of significance between the two new alternatives (3 and 4), and these levels were found to the same as for Alternative 2. However, the actual significance point scores did vary, and this together with the specialists opinion resulted in the levels of preference presented below.

Table 3: Preference Rating of Alternative Corridors.

Alternative	Preference Rating	Notes
1	9	*No longer under consideration.*
2	7	Shorter length than 3 and 4. Closest to existing disturbed areas which have lower likelihood of sensitive species.
3	5	Near to farm dams. Longest alternative higher probabilities of impacts.
4	6	Crosses a small pan potentially more sensitive species.

As can be seen from Table 3 there are no fatal flaws on all alternatives, and all are, with mitigation, considered to be acceptable from an avifaunal perspective. Furthermore it is noted Alternative 2 is now most preferred, while Alternative 3 is the least preferred.

6 CONCLUSION

The majority of the Study site consists of disturbed grassland and agriculture and the most important avifaunal micro-habitats are considered to be pans and farm dams. The site visit carried out in 2014 did not reveal any additional micro-habitats to those identified during surveys carried out in 2011.

Bird species considered most likely to be at risk from the construction and operation of the power line are waterfowl (including various duck species) and Flamingos. However, provided the mitigation proposed in Table 3 is applied then the proposed power line presents a low to medium level of avifaunal impact.

From an avifaunal perspective, the impacts associated with all three alternatives under consideration (2, 3 and 4) are considered to be acceptable with mitigation. Alternative 2 is the more preferred option and of the two additional alternative routes assessed Alternative 4 is considered to be slightly more preferable to Alternative 3.

7 REFERENCES

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Appendix 1- Construction Phase Impact Assessment for Alternative 3

Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance	**Nature of impact:**	Noise and movement, from staff and machinery, may disturb avifauna, and nests may be disturbed.							
	With mitigation	1	1	5	3	**21**	**Low**	-	Medium
	Without mitigation	2	1	7	4	**40**	**Medium**	-	Medium
	Degree to which impact can be reversed:	Partially reversible							
	Degree of impact on irreplaceable resources:	Low							
Habitat Destruction	**Nature of impact:**	Permanent removal of habitat that is used, or may be used, by avifauna.							
	With mitigation	1	2	4	4	**28**	**Low**	-	Medium
	Without mitigation	1	2	7	5	**50**	**Medium**	-	Medium
	Degree to which impact can be reversed:	Partially reversible							
	Degree of impact on irreplaceable resources:	Low							

Appendix 2- Operational Phase Impact Assessment for Alternative 3

Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Electrocution	**Nature of impact:**	Bird perches on pylon and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components, resulting in death or severe injury.							
	With mitigation	1	4	2	1	**7**	**Low**	-	High
	Without mitigation	2	4	4	2	**20**	**Low**	-	High
	Degree to which impact can be reversed:	Low							
	Degree of impact on irreplaceable resources:	medium							
Collisions	**Nature of impact:**	Collision or red data species with the overhead line (usually the earth wire).							
	With mitigation	2	4	2	3	**24**	**Low**	-	High
	Without mitigation	2	4	4	5	**50**	**Medium**	-	High
	Degree to which impact can be reversed:	Low							
	Degree of impact on irreplaceable resources:	medium							
Disturbance	**Nature of impact:**	Routine maintenance of pylons and power lines could result in disturbance of certain bird species							
	With mitigation	1	2	4	2	**14**	**Low**		medium
	Without mitigation	2	2	4	3	**24**	**Low**		medium
	Degree to which impact can be reversed:	High							
	Degree of impact on irreplaceable resources:	Low							

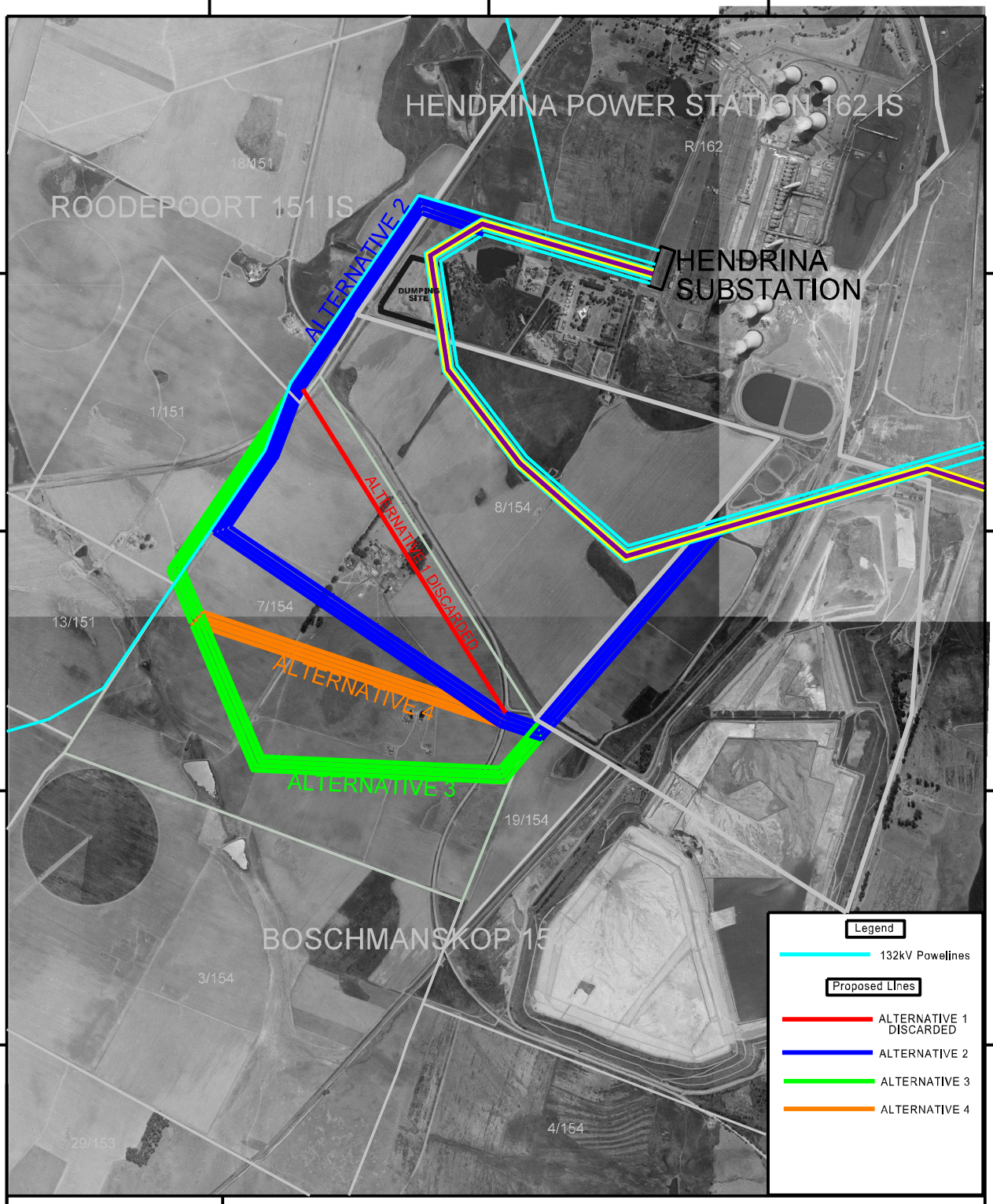
Appendix 3- Construction Phase Impact Assessment for Alternative 4

Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance	**Nature of impact:**	Noise and movement, from staff and machinery, may disturb avifauna, and nests may be disturbed.							
	With mitigation	1	1	4	3	**18**	**Low**	-	Medium
	Without mitigation	2	1	6	4	**36**	**Medium**	-	Medium
	Degree to which impact can be reversed:	Partially reversible							
	Degree of impact on irreplaceable resources:	Low							
Habitat Destruction	**Nature of impact:**	Permanent removal of habitat that is used, or may be used, by avifauna.							
	With mitigation	1	2	4	4	**28**	**Low**	-	Medium
	Without mitigation	1	2	6	5	**45**	**Medium**	-	Medium
	Degree to which impact can be reversed:	Partially reversible							
	Degree of impact on irreplaceable resources:	Low							

Appendix 4- Operational Phase Impact Assessment for Alternative 4

Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Electrocution	**Nature of impact:**	Bird perches on pylon and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components, resulting in death or severe injury.							
	With mitigation	1	4	2	1	**7**	**Low**	-	High
	Without mitigation	2	4	4	2	**20**	**Low**	-	High
	Degree to which impact can be reversed:	Low							
	Degree of impact on irreplaceable resources:	medium							
Collisions	**Nature of impact:**	Collision or red data species with the overhead line (usually the earth wire).							
	With mitigation	1	4	2	4	**28**	**Low**	-	High
	Without mitigation	2	4	4	5	**50**	**Medium**	-	High
	Degree to which impact can be reversed:	Low							
	Degree of impact on irreplaceable resources:	medium							
Disturbance	**Nature of impact:**	Routine maintenance of pylons and power lines could result in disturbance of certain bird species							
	With mitigation	1	2	4	2	**14**	**Low**		medium
	Without mitigation	2	2	4	3	**24**	**Low**		medium
	Degree to which impact can be reversed:	High							
	Degree of impact on irreplaceable resources:	Low							

Appendix 5: Figure showing Alternatives 3 and 4 (As produced by Eskom and supplied by Lidwala Consulting Engineers)



Eskom Distribution

HENDRINA SUBSTATION
RELOCATION OF THE 4 x DX 132KV LINES FOR THE ASH DAM PROJECT

SCALE: 1: 25 000

DRAWN: NTOMBI MASANGO

SURVEYED BY: JAMES ZULU

MAP REQUESTED BY: MILTON MOLOKO

DATE: 27/08/2014

SET	SHEET	REVISION
		4

A4L

Appendix 6: Method of assessment supplied by Lidwala (November 2011)

The Significance Rating Scales – for an EIA
Example 3

Issues are assessed in terms of the following criteria:

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

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

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

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

- **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **31-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).