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WETLAND IMPACT ASSESSMENT

PROPOSED DEVIATION OF THE JUNO-GROMIS 400 KV POWER LINE CORRIDOR PROJECT, NORTHERN CAPE AND WESTERN CAPE PROVINCES

SEPTEMBER 2016

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Declaration

I **Rowena Harrison,** declare that -

- I act as the independent specialist in this matter;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the National Environmental Management Act (Act 107 of 1998)(NEMA), regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the NEMA Act, regulations and all other applicable legislation;
- As a registered member of the South African Council for Natural Scientific Professions in terms of the Natural Scientific Professions Act, 2003 (Act No. 27 of 2003), I will undertake my professional duties in accordance with the Code of Conduct of the Council, as well as any other societies of which I am a member; and
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; all the particulars furnished by me in this report are true and correct.

Signature of the specialist: 

Date: 12/09/2016

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Executive summary

Afzelia Environmental Consultants (Pty) Ltd was appointed by Nsovo Environmental Consulting to undertake a wetland and watercourse sensitivity assessment for the presence of wetland or watercourse systems for the deviation of the proposed construction of the Juno-Gromis 400kV transmission power line project from the authorised corridor, traversing through portions of the Western and Northern Cape provinces. The power line will traverse in a southerly direction, exiting the Gromis Substation, near Kleinsee, and will enter the Juno Substation just outside Vredendal. It will be approximately 230km long. The deviation of the power line occurs within three localities along the authorised route namely Lutzville landing strip (a deviation of ±4.1km), Tronox Mine Namakwa Sands (a deviation of ±3km) and at Kamiesberg Mine (a deviation of ±7.2km).

The main findings of this report which focuses on the three deviation areas have been summarised below:

i. No wetland systems are located within any of the three deviation areas.
ii. Numerous 'A' Section and 'B' Section channels were delineated along the power line corridor and are associated with seasonal non-perennial rivers as well as temporary drainage systems.
iii. 'A' Section and 'B' Section channels were delineated along the power line corridor and are associated with seasonal non-perennial rivers as well as temporary drainage systems.
iv. The proposed tower positions in closest proximity to each wetland/watercourse identified along the route were recorded to be used in finalising the position of each tower.
v. A number of potential impacts have been identified relating to soil erosion and sedimentation, alteration to the hydrological flow entering the wetland areas, pollution of wetlands and soil as a result of construction and operational activities.
vi. Mitigation measures are key to limiting the negative effects on the watercourses and must be included in an Environmental Management Programme for the proposed project.

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1. INTRODUCTION

1.1 Background and Locality of the assessment

Afzelia Environmental Consultants (Pty) Ltd was appointed by Nsovo Environmental Consulting to undertake a wetland and watercourse sensitivity assessment for the presence of wetland or watercourse systems for the deviation of the proposed construction of the Juno-Gromis 400kV transmission power line project from the authorised corridor, traversing through portions of the Western and Northern Cape provinces. The power line will traverse in a southerly direction, exiting the Gromis Substation, near Kleinsee, and will enter the Juno Substation just outside Vredendal. It will be approximately 230km long. The deviation of the power line occurs within three localities along the authorised route Lutzville landing strip (a deviation of ±4.1km), Tronox Mine Namakwa Sands (a deviation of ±3km) and at Kamiesberg Mine (a deviation of ±7.2km).

The main purpose of this report is to identify watercourse systems which are located along the deviated corridor, to map these watercourses in relation to the proposed tower positions and to provide an assessment of potential impacts and recommended mitigation measures to limit these impacts. This report must be read in conjunction with the Wetland Impact Assessment Report for the Proposed Juno-Gromis 40kV power line corridor project (Afzelia Environmental Consultants, 2016).

1.2 Scope of work

The scope of work entailed the following:

- Conduct a walk down of the deviation areas along the proposed Juno-Gromis 400kV power line corridor in order to identify and delineate wetland or watercourse systems along the route which may be affected by the proposed project.
- Delineate the outer boundary of wetland/riparian habitats within a 500m buffer from the proposed power line corridor according to the methods contained in the manual 'A Practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas' (DWAF, 2005);
- Identify potential negative impacts on the wetland(s) from the proposed project and assess the significance of these impacts;
- Provide recommended mitigation measures for the identified impacts in order to avert or lower the significance of the negative impacts.

1.3 Assumptions and Limitations

It is difficult to apply pure scientific methods within a natural environment without limitations, and consequentially assumptions need to be made. The following constraints may have affected this assessment –

- The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on the watercourses.
- A hand held Garmin eTrex 20x was used to delineate the watercourse areas and this has an accuracy of 3-5m;
- Phase 2 of the field survey involved the use of a helicopter due mainly to the inaccessibility of portions of the power line corridor. In these areas soil wetness, soil form as well as vegetation dynamics could not be relied upon to determine boundaries of wetlands and watercourses; the terrain unit indicator was applied. Due to the arid nature of the larger study area and the lack of soil hydric properties and lack of hydrophytic vegetation the use of the helicopter is not expected to limit the reliability of the results obtained.
- No data regarding positioning, design and the construction of access roads has been provided. This aspect of the project has therefore not been assessed.

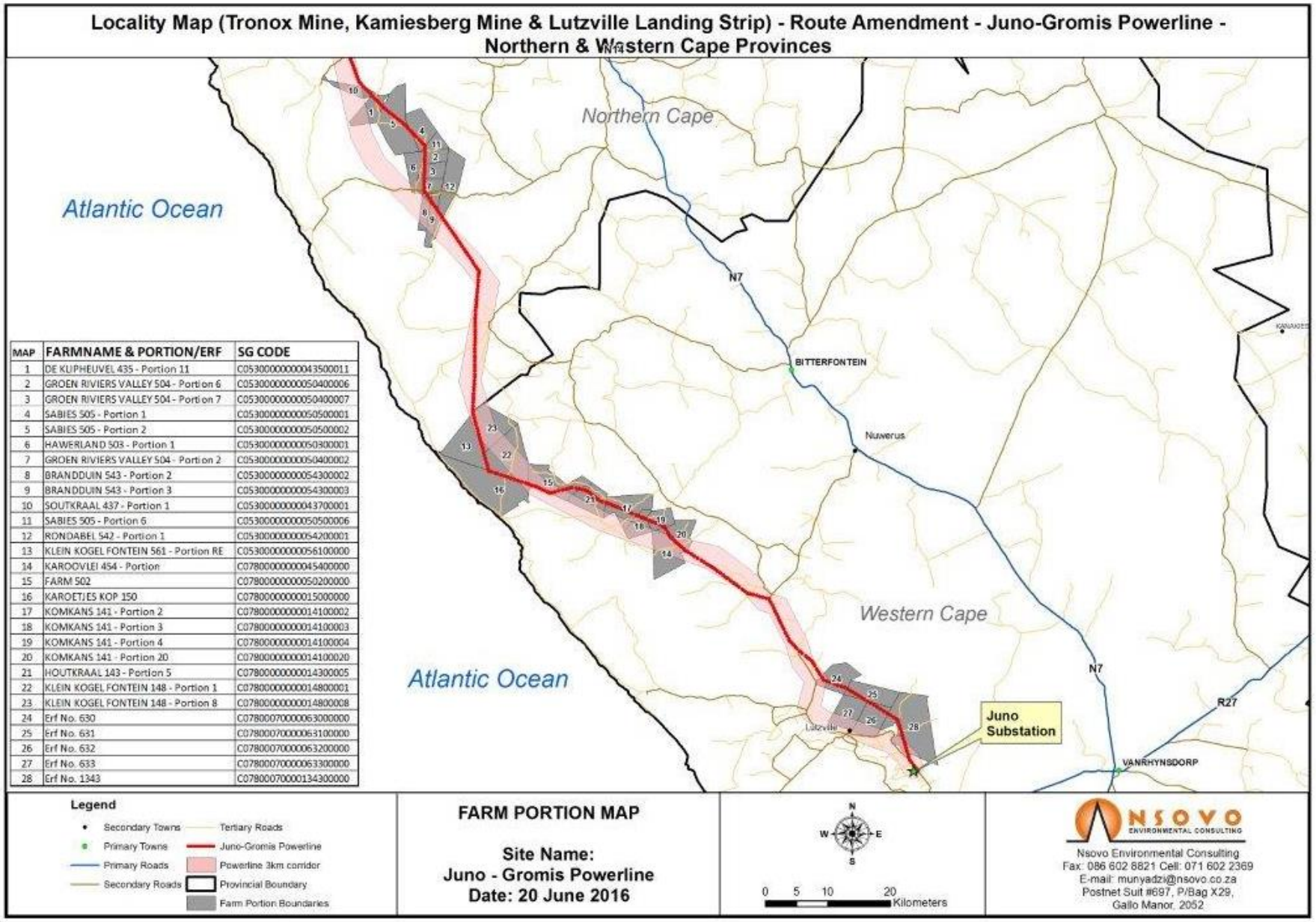

Figure 1: Locality of the proposed deviation areas along the power line corridor

2. METHODOLOGY

2.1. Assessment techniques and tools

An initial desktop review of the study site was undertaken before the site visit using data from a variety of sources (this list is detailed under 2.2 Sources of Information). The walk-down was then undertaken during a seventeen-day field investigation from the 29th February to the 16th March 2016. The power line corridor including the deviation areas was assessed on the ground during this visit and wetlands and watercourses delineated. Due to limitations experienced as a result of poor access to portions of the power line corridor a second phase site visit was undertaken from the 11th to the 15th April using a helicopter to survey these areas for wetlands and watercourses systems.

2.2. Sources of information

The following information and datasets were used to support the desktop and infield assessment of the study area as well as the compilation of this report:

i. Google Earth ™ satellite imagery was used at the desktop level to delineate desktop wetlands and watercourses;
ii. Relief dataset from the Surveyor General was used to calculate slope and in the desktop mapping of wetlands and watercourses;
iii. The NFEPA dataset (Driver, *et al*., 2011) was used in determining any priority wetlands;

3. RESULTS

Numerous drainage channels associated with non-perennial river systems were identified along the deviation areas of the power line based on topographic setting, vegetative indicators and the presence or absence of alluvial soils as described in 'A Practical Field Procedure for Identification and Delineation of Wetland and Riparian Areas – Edition 1' (DWAF, 2005) requirements. This manual separates the classification of watercourses into three (3) separate types of channels or sections defined by their position relative to the zone of saturation in the riparian area. The classification system separates channels into:

- those that do not have baseflow ('A' Sections).
- those that sometimes have baseflow ('B' Sections) or are classified as non-perennial.
- those that always have baseflow ('C' Sections) or are classified as perennial.

'A' Section and 'B' Section channels were identified along the power line route including the deviation areas. 'B' Section channels are non-perennial river systems through which the power line will traverse. The 'A' Section channels are associated with very temporary drainage channels that will convey stormwater into the larger non-perennial rivers. Appendix A depicts the watercourses within a 500m buffer surrounding the proposed deviation areas from the power line corridor. The figures do not show the entire watercourse system which in the majority of cases is much larger than that shown.

4. PROPOSED DEVIATION 1 AT LUTZVILLE LANDING STRIP

This deviation occurs within close proximity of the existing Juno Substation, 7km East of Lutzville and is associated with 30 towers (572 to 542). Six 'A' Section drainage channels and two 'B' Section channels, named the Hol River and the Moedverloor River, were delineated during the walk down (**Figure 2**).

The watercourses are classified and described in relation to the tower position in **Table 1**[1] below.

[1] The approximate distance to the proposed tower position is also provided. It must be noted that this position is to the GPS coordinate provided by Eskom indicating the central position of the entire tower structure.

Table 1: Watercourses delineated within Deviation Area 1 and approximate distance to tower number

Wetland or Watercourse Classification	Tower Number	Approximate distance to tower centre point (m)
A Section Channel	573	100
	572	53
	571	235
B Section Channel (Hol River)	570	90
	569	23m from channel edge however the tower is situated in the alluvial floodplain
B Section Channel (Moedverloor River)	568	393
	566	336
	565	285
	564	120
	563	76
	562	185
	561	326
A Section Channel	543	344
	542	126
	541	137

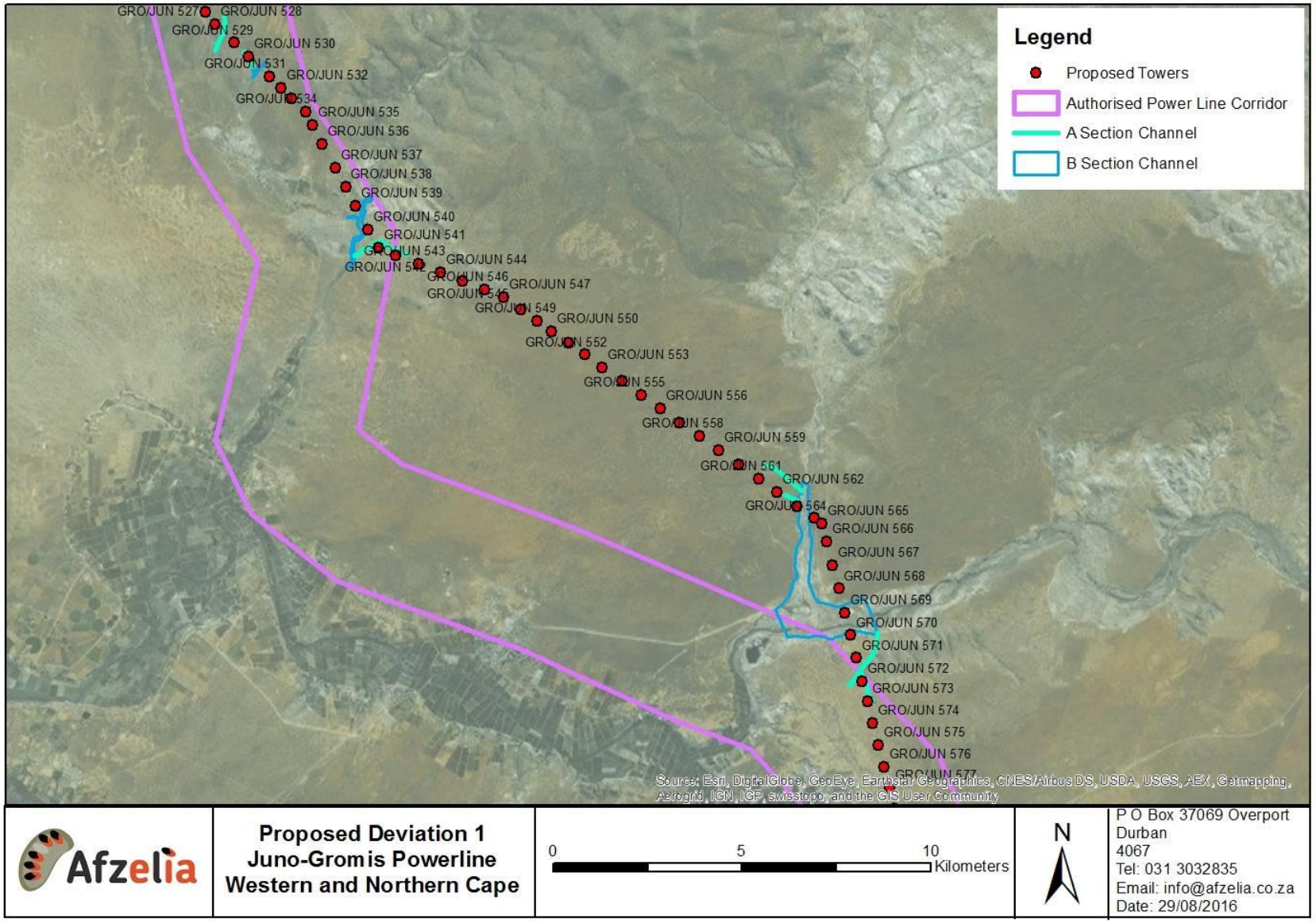

Figure 2: Watercourses along the Proposed Deviation 1 at Lutzville Landing Strip

5. PROPOSED DEVIATION 2 AT TRONOX MINE

This proposed deviation is associated with 40 towers (474 to 434) in the vicinity of Tronox Mine, Namaqua Sands. Two 'B' Section channels were delineated during the walk down (**Figure 3**). One of these is named the Groot-Goerap River. These are classified and described in relation to the tower position in **Table 2** below.

Table 2: Watercourses delineated within Deviation Area 2 and approximate distance to tower number

Wetland or Watercourse Classification	Tower Number	Approximate distance to tower centre point (m)
B Section Channel	473	486
	472	212
	471	25
	470	110
	469	10
	468	270
	467	484
	466	465
	465	95
B Section Channel (Groot-Goerap River)	464	262
	463	356
	462A	40
	462	190
	461	261
	460	197
	459	445
	458	440
	457	305
	456	406
	450	313
	449	400
	448	463
	438	400
	437	438

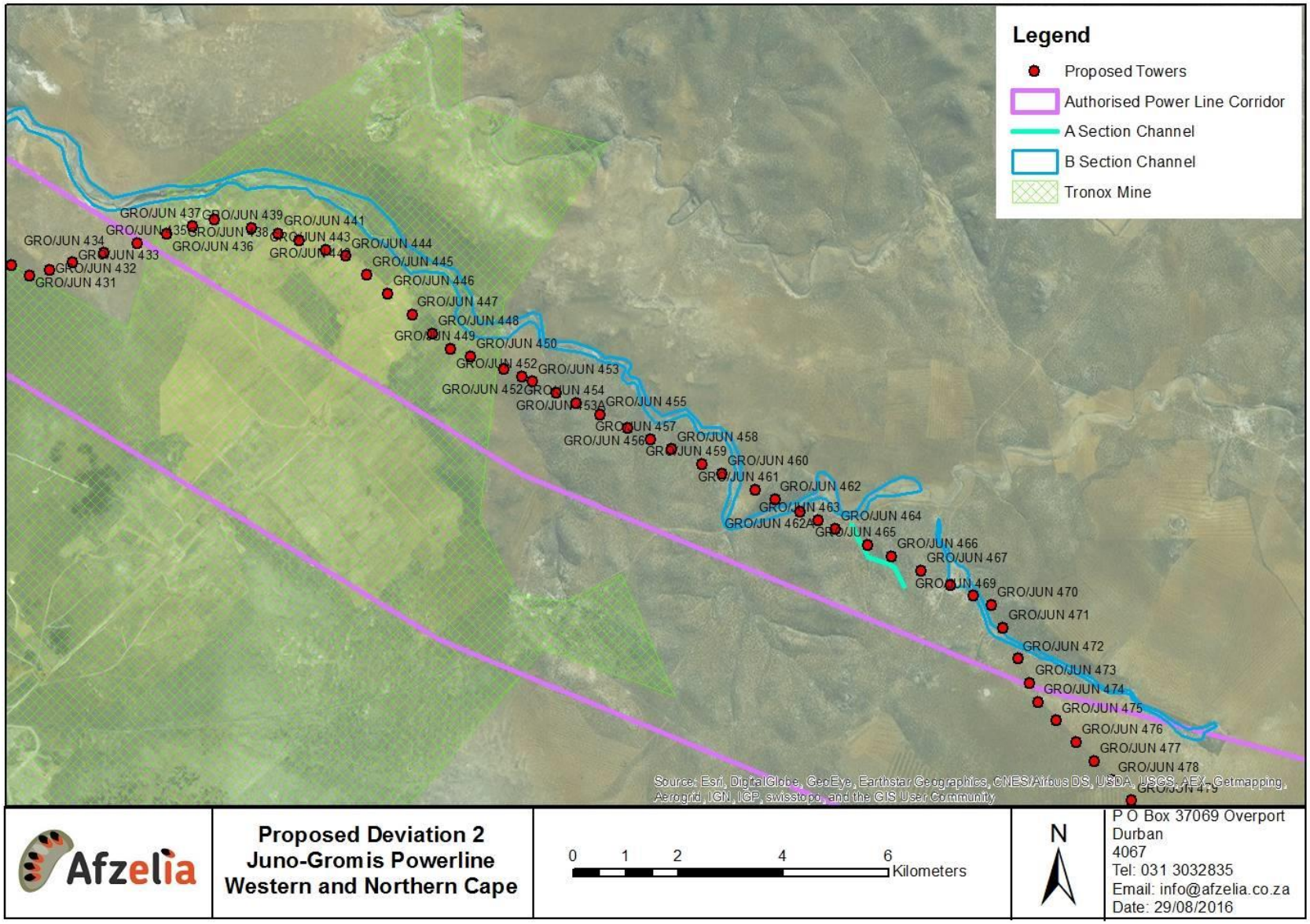

Figure 3: Watercourses along the Proposed Deviation 2 at Tronox Mine, Namaqua Sands

6. PROPOSED DEVIATION 3 AT KAMIESBERG MINE

This proposed deviation is associated with 50 towers (323 to 273). One 'B' Section Channel, named the Groen River as well as six 'A' Section channels were delineated during the walk down (**Figure 4**).

These are classified and described in relation to the tower position in **Table 3** below.

Table 3: Watercourses delineated within Deviation Area 3 and approximate distance to tower number

Wetland or Watercourse Classification	Tower Number	Approximate distance to tower centre point (m)
B Section Channel (Groen River)	319	406
	318	151
	317	68
	316	237
A Section Channels	306	191
	305	388
	303	78
	302	213
	295	26
	294	91
	293	232
	292	246
	291	119
	290	379

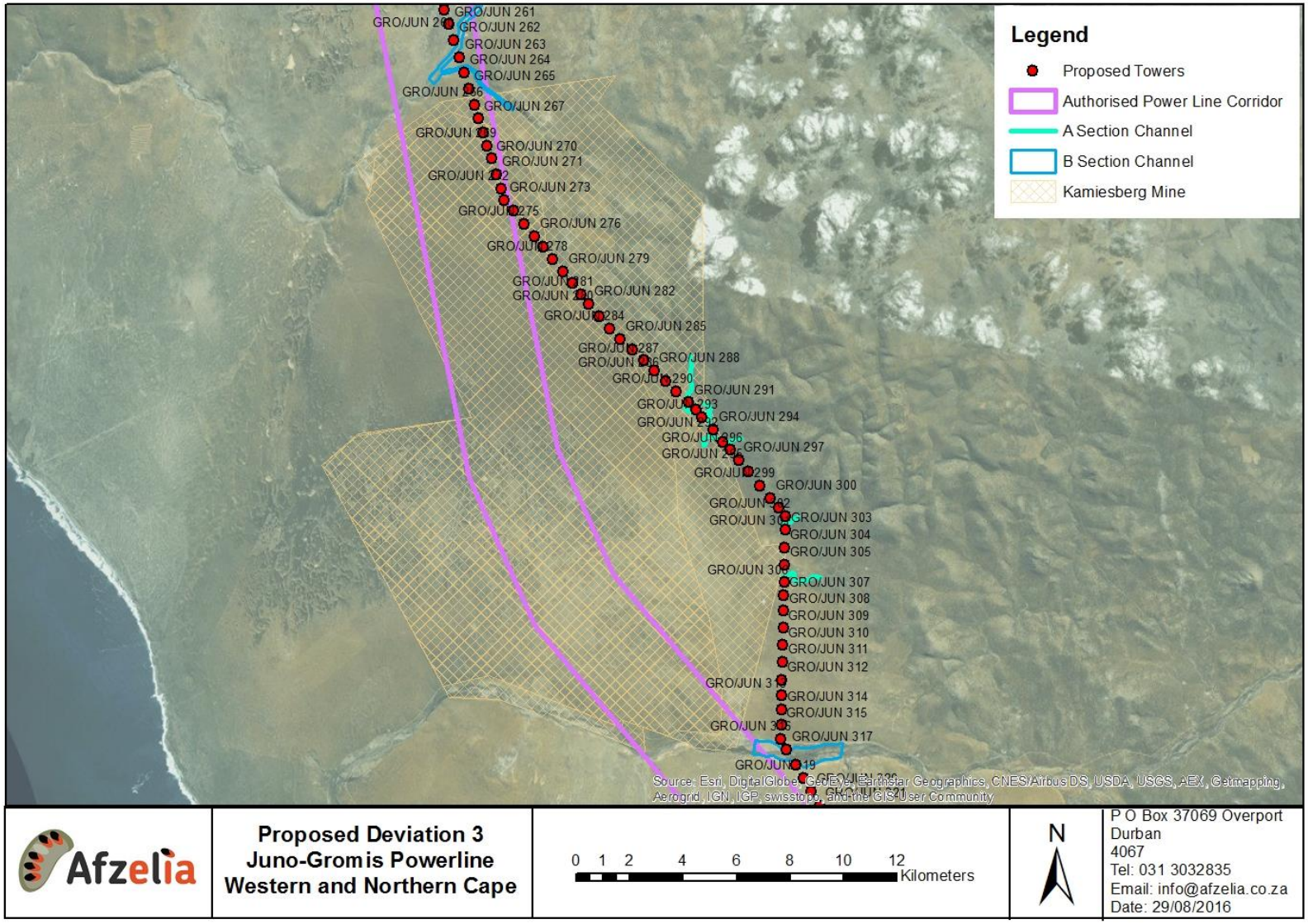

Figure 4: Watercourses along the Proposed Deviation 3 at Kamiesberg Mine

7. IMPACTS

7.1 Loss of watercourse habitat and ecological structure

Towers placed within watercourse boundaries will lead to the direct loss of the watercourse area at this point having knock-on effects on the hydrological flow through watercourse and possibly leading to erosion in the long term. Wind erosion is of particular concern as this is a major distribution of soil in this region. Sedimentation by the deposited soil downslope of the corridor further poses a risk to the geomorphological/functional integrity of the non-perennial watercourse systems that will be crossed. It also impacts on the water quality downstream of the construction site reducing the ecological integrity of these systems outside of the construction servitude.

7.2 Pollution of water resources and soil

Sediment release from a construction site into an aquatic environment is one of the most common forms of waterborne pollution. Furthermore, mismanagement of waste and pollutants like hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting sensitive natural environments either directly through surface runoff during rainfall events, or subsurface water movement.

8. MITIGATION OF IDENTIFIED IMPACTS

8.1 Loss of watercourse habitat and ecological structure

- The creation of access roads must take all watercourses into consideration and these systems must be avoided.
- The development footprint area is to be limited to what is absolutely essential so that environmental damage is minimised along the power line corridor.
- Demarcate all sensitive ecological areas outside of the construction servitude and ensure that these areas remain off-limits during construction.
- No vehicles must be allowed to drive through and within watercourse channels.
- No stockpiling of any materials may take place adjacent to any of the watercourses. Erosion control measures must be implemented in areas sensitive to erosion, particularly in areas prone to wind erosion and where erosion has already occurred. These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.
- Do not allow surface water or storm water to be concentrated, or to flow down slopes without erosion protection measures being in place.
- The entire construction area must not be stripped of vegetation prior to commencing construction activities.
- Vegetation clearing within 50m of any of the watercourses must only be undertaken when construction activity is actually underway at these points.
- All disturbed areas must be rehabilitated within the first month after construction in an area is complete and not left until the end of the project to be rehabilitated.
- Any channel banks that will be affected must be re-profiled as per the original soil horizon structure and re-vegetated with indigenous species.
- Tower 569 is proposed to be built in an alluvial floodplain. Particular emphasis on soil erosion preventative measures must be adhered to in this area.

8.2 Pollution of water resources and soil

- All waste generated during construction is to be disposed of as per an Environmental Management Programme (EMPr) and no washing of containers, wheelbarrows, spades, picks or any other equipment adjacent to or in any of the drainage channels, non-perennial rivers along the power line corridor is permitted.
- Proper management and disposal of construction waste must occur throughout the lifespan of the project, especially during maintenance of the power line.
- No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourses.

9. CONCLUSION

No wetland systems are located within any of the three deviation areas. Numerous 'A' Section and 'B' Section channels were delineated along the power line corridor and are associated with seasonal non-perennial rivers as well as temporary drainage systems. 'A' Section and 'B' Section channels were delineated along the power line corridor and are associated with seasonal non-perennial rivers as well as temporary drainage systems. The proposed tower positions in closest proximity to each wetland/watercourse identified along the route were recorded to be used in finalising the position of each tower. A number of potential impacts have been identified relating to soil erosion and sedimentation, alteration to the hydrological flow entering the wetland areas, pollution of wetlands and soil as a result of construction and operational activities.

The deviation of the route at the three localities is not deemed significant from a wetland and watercourse perspective. However, mitigation measures will be key to limiting the negative effects on the watercourses and must be included in an Environmental Management Programme for the proposed project.

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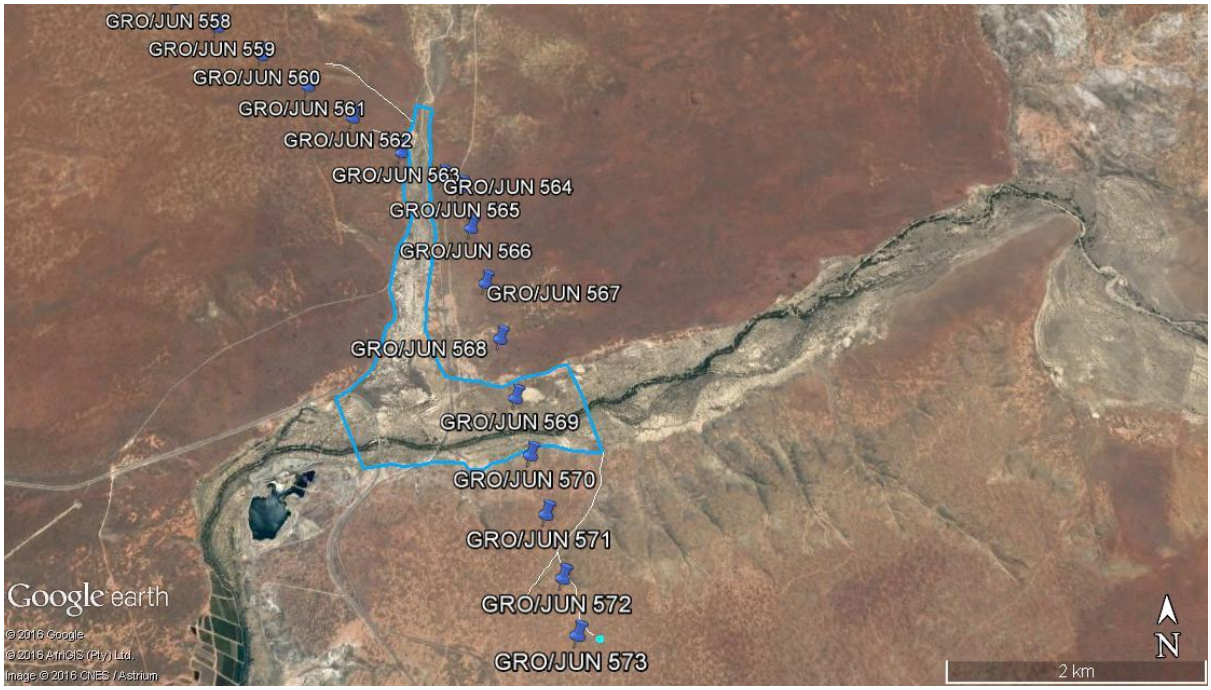
Appendix A.

Aerial imagery of the wetlands and watercourses in relation to the tower positions at the deviation areas

Key:
Dark blue – 'B' Section Channels
White – 'A' Section Channels

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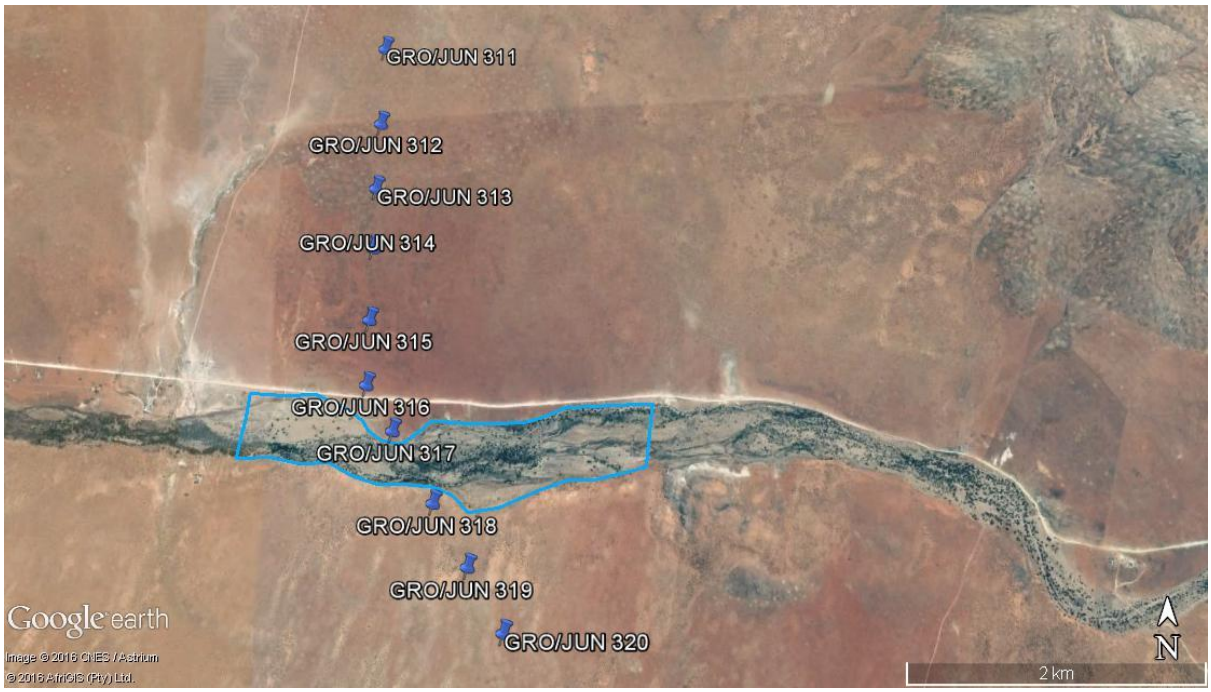
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