

**NATURA VIVA cc**  
**Palaeontological Impact Assessments & Heritage Management,**  
**Natural History Education, Tourism, Research**

**Attn: Ms Belinda Huddy**  
**EOH Coastal & Environmental Services**  
**The Point, Suite 408, 4th Floor**  
**76 Regent Road**  
**Sea Point, Cape Town RSA**

**Date: 20 July 2016**

**ASSESSMENT OF CUMULATIVE IMPACTS ON PALAEOONTOLOGICAL HERITAGE  
RESOURCES: BRANDVALLEY WEF NEAR SUTHERLAND, W. & N. CAPE**

Dear Ms Huddy,

This is to confirm that when preparing the palaeontological heritage assessment for the proposed Bransvalley WEF I have reviewed and taken into consideration palaeontological heritage impact studies for the numerous proposed or approved alternative energy developments in the region between Sutherland and Matjiesfontein, as shown in the map given below (Fig. 1). The great majority of the relevant field-based palaeontological studies were carried out by the present author (See References). I have also considered a small number of additional palaeontological desktop studies for alternative energy and transmission line projects as well as broad-based Strategic Environmental Assessment (SEA) studies for the SW Karoo region, such as those for the Square Kilometer Array and Shale Gas Exploration.

On the basis of these recent field-based and desktop studies, it was concluded in Section 4.1 of my palaeontological heritage assessment of the proposed Brandvalley WEF that cumulative impacts envisaged for this and nearby alternative energy developments are of **low (negative) significance**:

*A considerable number of alternative energy developments have been proposed or authorised in the broader south-western Karoo region within which the Brandvalley WEF study area is situated (See Fig. 53). Several of these projects entail impacts on fossil heritage resources preserved within the same rock units of the Karoo Supergroup and overlying superficial sediments that are represented within the present study area. It is noted that this region also falls within the shale gas prospecting area of Falcon Oil and Gas Ltd as well as the broader study area for the on-going Strategic Environmental Assessment for shale gas exploitation in the Karoo (fracking) that is being co-ordinated by the CSIR. Desktop- and field-based assessments for a major proportion of these projects have been carried out by the author (See References) and colleagues (e.g. Miller 2011). For example, field assessments of the Rietkloof WEF and Kareebosch WEF (Roggeveld Phase 2) project areas situated immediately south and north of, as well as overlapping with, the Brandvalley WEF study area have recently been completed (Almond 2014, Almond, 2016b). In all cases it was concluded by the author that, despite the undoubted occurrence of scientifically-important fossil remains (notably fossil vertebrates, vertebrate*

*trackways and burrows, petrified wood), the overall impact significance of the proposed developments was low because the probability of significant impacts on unique or rare fossils was slight. Provided that the proposed monitoring and mitigation recommendations made for these various projects are followed through, their cumulative impact on palaeontological heritage resources - including impacts envisaged for the Brandvalley WEF project – is predicted to be low (negative). On the other hand, unavoidable residual negative impacts may be partially counterbalanced by an improved understanding of Karoo palaeontology resulting from appropriate professional mitigation for these projects. This is regarded as a significant positive impact for Karoo palaeontological heritage.*

These cumulative impacts are further assessed in tabular form in Table 1 above.

Cumulative impacts in this case refer to:

**Disturbance, damage or destruction of fossil heritage within the development footprint during the construction phase of the WEF combined with other developments in the region affecting the same sedimentary rock units (formations / members)**

It should be noted that palaeontological impacts inferred for development projects within a given region are only relevant where the same geological units (*e.g.* sedimentary formations or members), and hence the same fossil assemblages, are concerned. The cumulative impact assessment for the Brandvalley WEF given above has therefore focused primarily on potential impacts to fossil heritage within the lowermost portion of the Abrahamskraal Formation, the underlying Waterford Formation, as well as various Late Cenozoic superficial deposits (*e.g.* older alluvium).

Levels of confidence for this assessment are rated as moderate, given the large number of studies in the context of the generally low levels of bedrock exposure in the region.

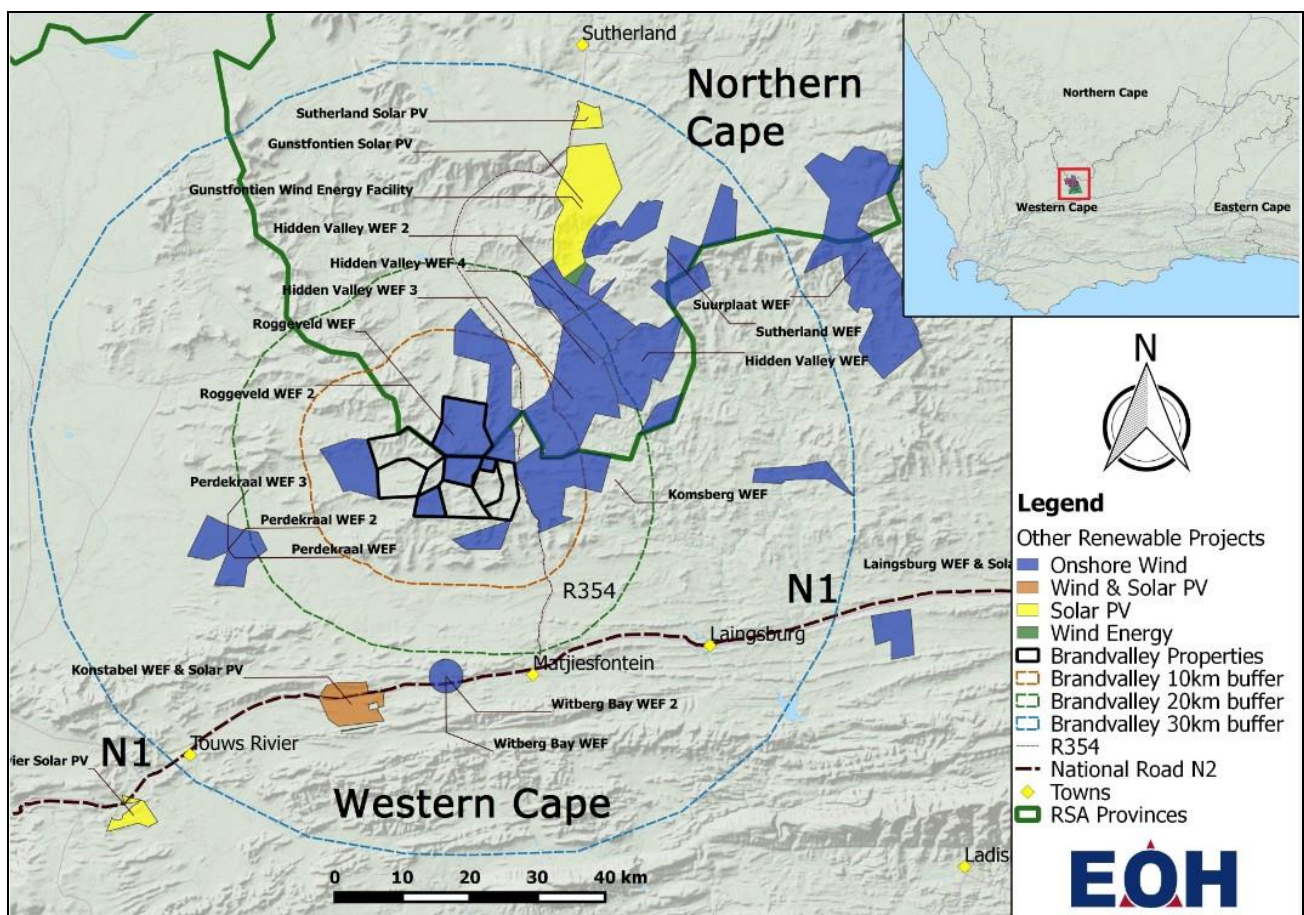
Yours sincerely,



**Dr John E. Almond**  
**Palaeontologist**  
*Natura Viva cc*

**Table 1: Assessment of cumulative impacts of the proposed Brandvalley WEF and other alternative energy projects in the region on local fossil heritage resources (construction phase)**

Impact	Effect			Risk or Likelihood	Overall Significance
	Temporal Scale	Spatial Scale	Severity of Impact		
<b>Impact : Disturbance, damage or destruction of fossil heritage within development footprint during the construction phase of the WEF combined with other developments in the region affecting the same sedimentary rock units (formations / members)</b>					
Without Mitigation	Permanent	Localized	Slight	Definite	LOW -
With Mitigation	Permanent	Localized	Slight	Definite	LOW -



**Figure 1. Map outlining proposed or approved alternative energy projects in the SW Karoo region surrounding the Brandvalley WEF project area (black polygon) (Image kindly supplied by EOH).**

## REFERENCES

ALMOND, J.E. 2005. Palaeontological scoping report: Proposed golf estate, Sutherland, Northern Cape, 10 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2010a. Eskom Gamma-Omega 765kV transmission line: Phase 2 palaeontological impact assessment. Sector 1, Tanqua Karoo to Omega Substation (Western and Northern Cape Provinces), 95 pp + appendix. Natura Viva cc, Cape Town.

ALMOND, J.E. 2010b. Palaeontological impact assessment: desktop study – Proposed Suurplaat wind energy facility near Sutherland, Western Cape, 33 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2010c. Proposed Mainstream wind farm to the southeast of Sutherland, Northern Cape and Western Cape Provinces. Palaeontological impact assessment: pre-scoping desktop study, 19 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2011. Proposed photovoltaic solar energy facility on the farm Jakhals Valley (RE/99) near Sutherland, Karoo Hoogland Municipality, Northern Cape Province. Palaeontological specialist study: combined desktop and field assessment, 34 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2014. Proposed Karreebosch Wind Farm (Roggeveld Phase 2) near Sutherland, Northern Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 63 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2015a. Proposed Perdekraal East Wind & Solar Renewable Energy Facility near Touwsrivier, Ceres Magisterial District, Western Cape Province. Palaeontological impact assessment: field study, 68 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2015b. Proposed expansion of the existing Komsberg Main Transmission Substation on Farm Standvastigheid 210 near Sutherland, Northern Cape Province. Paleontological heritage assessment: combined desktop & field-based study (basic assessment), 39 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2015c. Authorised Karusa Wind Farm near Sutherland, Namaqua District Municipality, Northern Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 57 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2015d. Authorised Soetwater Wind Farm near Sutherland, Namaqua District Municipality, Northern Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 57 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2015e. Komsberg East Wind Energy Facility near Sutherland, Laingsburg District, Western Cape. Palaeontological scoping assessment: combined desktop and field-based study, 51 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2015f. Komsberg West Wind Energy Facility near Sutherland, Laingsburg and Sutherland District, Western and Northern Cape. Palaeontological scoping assessment: combined desktop and field-based study, 55 pp. Natura Viva cc, Cape Town.

- ALMOND, J.E. 2015g. Proposed Gunstfontein Wind Energy Facility near Sutherland, Karoo Hoogland Local Municipality, Northern Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 62 pp. Natura Viva cc, Cape Town.
- ALMOND, J.E. 2016a. Square Kilometre Array (SKA) core and Phase 1 development area, Great Karoo, Northern Cape - palaeontological heritage, 38 pp. Natura Viva cc, Cape Town.
- ALMOND, J.E. 2016b. Proposed Rietkloof Wind Energy Facility near Laingsburg, Laingsburg District, Western Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 82 pp. Natura Viva cc, Cape Town.
- ALMOND, J.E. 2016c. Proposed Brandvalley Wind Energy Facility near Laingsburg, Laingsburg & Sutherland Districts, Western & Northern Cape Provinces. Palaeontological heritage assessment: combined desktop & field-based study, 66 pp. Natura Viva cc, Cape Town.
- ALMOND, J.E. 2016d. Esizayo Wind Energy Facility near Laingsburg, Western Cape: palaeontological heritage. Desktop scoping report, 7 pp. Natura Viva cc, Cape Town.
- ALMOND, J.E. 2016d. Maralla Wind Energy Facility near Sutherland, Northern Cape and Western Cape: palaeontological heritage. Desktop scoping report, 8 pp. Natura Viva cc, Cape Town.
- ALMOND, J.E. 2016f. SKA Core and Phase 1 development area, Great Karoo, Northern Cape - palaeontological heritage, 38 pp. Natura Viva cc.
- DURAND, J.F. 2013. Gamma-Kappa 765kV Transmission Line, Western Cape Province. Scoping report palaeontology, 22 pp.
- MILLER, D. 2011. Roggeveld Wind Farm: palaeontology study, 7 pp. Appendix to Archaeological, Heritage and Paleontological Specialist Report prepared by ACO Associates, St James.
- MILLSTEED, B.D. 2013. Desktop palaeontological heritage impact assesment report on the site of proposed solar and wind energy generation facilities (Gunstfontein project) to be located on various farms near Sutherland, Northern Cape Province, 32 pp. B.M. Geological Services, Hatfield.
- ROSSOUW, L. 2013. Palaeontological desktop assessment of the proposed Hidden Valley Wind Energy Facility near Sutherland, Northern Cape, 17 pp.

**CUMULATIVE IMPACTS FOR THE PROPOSED BRANDVALLEY WEF**

<b>DEA Comment</b>	<b>Action</b>	<b>Yes/No</b>	<b>Proof in Report</b>
<i>Due to the number of similar applications in the area, all the specialist assessments must include a cumulative environmental impact statement. Identified cumulative impacts must be clearly defined and where possible the size of the identified impact must be indicated, i.e. hectares of cumulatively transformed land.</i>	Is a cumulative impact statement included in the report?	YES	Section 4.1
	Are cumulative impacts clearly defined?	YES	See accompanying letter
	Has the size of the identified cumulative impact been indicated in the report?	YES	See accompanying letter (Table 1)
<i>Identified cumulative impacts significance rating must be rated with significance rating methodology approved with the acceptance of the scoping report.</i>	Do the cumulative impacts include a significance rating as per the assessment methodology?	YES	See accompanying letter (Table 1)
<i>Detailed cumulative impact assessments must be provided in the EIAr for all specialist studies conducted. The specialist studies must provide proof that other specialist reports that was conducted for renewable energy projects in the area were reviewed and indicated how the recommendations, mitigation measures and conclusions have been taken into consideration when the conclusion and mitigation measures were drafted for this project.</i>	Does the report provide proof that other specialist reports conducted for renewable energy projects in the area were reviewed and indicate how the recommendations, mitigation measures and conclusions have been taken into consideration?	YES	Reference list in original report as well as accompanying letter (Most of these studies are by the same author)

*John E. Almond*

Signature of the specialist:  
NATURA VIVA CC

*John E. Almond*

Name of company / specialist:  
20 July 2016  
Date: