



## BPI for Palaeontological Research

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**20 June 2008**

Mr Alfonso Niemand  
Nature and Business Alliance Africa (Pty) Ltd.

[alfonso@yebo.co.za](mailto:alfonso@yebo.co.za)

Dear Mr Niemand,

**Secunda Sasolburg pipeline - DEAT Project reference Number 12/12/20/1067.**

As requested by you I have now undertaken an EIA to assess the affect that the installation of the high-pressure gas transmission pipeline from Sasol Synfuels in Secunda to Sasol Infrachem in Sasolburg will have on palaeontological heritage in the area. My report is included herewith.

In my opinion this development will not negatively affect palaeontological heritage in the area affected.

Please come back to me if there is anything you do not understand or are unhappy with in the reports.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'B. Rubidge'.

**Professor Bruce Rubidge**

# **INSTALLATION OF HIGH PRESSURE NATURAL GAS TRANSMISSION PIPELINE FROM SASOL SYNFUELS IN SECUNDA TO SASOL INFRACHEM IN SASOLBURG, VIA BALFOUR – PALAEOLOGICAL IMPACT ASSESSMENT**

## **Introduction**

An EIA was undertaken along the proposed course of the high pressure gas pipeline between Secunda and Sasolburg to determine the affect that the installation will have on palaeontological heritage in the area. Following the information document (DEAT Project reference Number 12/12/20/1067) the proposed gas pipeline route will extend from Sasol Synfuels in Secunda to Sasol Infrachem in Sasolburg. This report covers the area which is to be affected by the gas pipeline.

## **Generalised Geology of the route traversed**

The traverse route of the proposed pipeline covers rocks of the Witwatersrand, Ventersdorp and Karoo Supergroups which vary in age from Precambrian in the case of the Witwatersrand and Ventersdorp, to Permian and Jurassic in the case of the Karoo.

The formations of each of the supergroups which will be traversed are:

Karoo Supergroup –	Karoo dolerite (dolerite) Vryheid Formation (mudstones and subordinate sandstone)
Ventersdorp Supergroup -	Klipriviersberg Group (conglomerates, quartzites and lavas)
Witwatersrand Supergroup-	Turffontein Formation (quartzites)



*Figure 1. Area south of Secunda underlain by Vryheid Formation*

## **Specific geology of route**

On the eastern side of the traverse of the proposed pipeline in the area immediately south of Secunda, between Sasol Synfuels and the farm Tweefontein, the pipeline will initially

traverse rocks of the Vryheid Formation (Figure 1) and further south will cross Karoo dolerites.

On the farm Tweefontein the proposed path of the pipeline swings westward and covers mainly rocks of the Vryheid Formation with intermittent dolerite as far as the farm Raskop. No rock outcrop is visible in this area and most of the area is covered by thick soil supporting either grassland or has been planted with crops.

From Raskop proceeding westwards to the farm Hartbeesfontein the pipeline traverses countryside which is underlain by an extensive dolerite sill. Here the route extends southwesterly to overlie rocks of the Vryheid Formation as far as the farm Van Kolderskop. Except for a small area of rock outcrop around the pan on Leeukraal, which is not affected by the proposed pipeline, there are no visible outcrops of the Vryheid Formation and the entire area is covered by soil.



*Figure 2: Outcrops of Ventersdorp Supergroup in background, grasslands in foreground are underlain by Vryheid Formation on the farm Van Kolderskop.*

From Van Kolderskop to Tweefontein the pipeline crosses rocks of the Ventersdorp and Witwatersrand Supergroups. These rocks weather positively, are exposed, and will probably be trenched in order to lay the pipeline (Figure 2).

For a small distance between the farms Tweefontein and Springfontein, which is where the pipeline will cross the Balfour-Standerton Highway, it will again traverse rocks of the Vryheid Formation but there are no outcrops of this formation in this area which is covered by cultivated fields and grassland.

Further west, between the farms Springfontein and Stersun, the route again traverses rocks of the Ventersdorp and Witwatersrand Supergroups which do form outcrops. West of Stersun right up to the farm Rietfontein 461 IR (situated north of the Vaal Dam) the pipeline will traverse an area underlain by rocks of Karoo Supergroup, mostly Vryheid Formation, but there is dolerite for short distances. This entire area is covered by either grassland or ploughed fields and there are no outcrops of Karoo Supergroup rocks along the traverse of the pipeline.

West of Rietfontein 461 IR the highlands of exposed quartzites are of the Witwatersrand Supergroup while further westwards the pipeline will be underlain by the Ventersdorp Supergroup. This continues all the way as far as the farm Hoekoe, except for a small distance covered by Karoo dolerites north of the most northerly bay of the Vaal Dam on the farm Hartebeesfontein 173 IR.



*Figure 3: Outcrops of Sandstone on the farm Amelia. These were the only significant outcrops of the Vryheid Formation in the study area*

Further westwards the remaining traverse of the pipeline as far as Sasolburg is underlain by rocks of the Karoo Supergroup. For most of the distance this is Vryheid Formation, but for a short distance on the farm Vaalbank 219 the area is underlain by a sill of Karoo dolerite. Apart from a small area of sandstone exposure on the farm Amelia (Figure 3), immediately north of the pipeline route, the Vryheid Formation has no outcrops and is covered by fields of grassland and crops.



*Figure 4: Area southeast of Sasolburg affected by human habitation which overlies the Vryheid Formation*

Closer to Sasolburg (Figure 4) the ground has been disturbed by building activity and there are no visible outcrops of the Vryheid Formation.

## **Palaeontological Heritage**

No fossils are known from the rocks of the Ventersdorp and Transvaal Supergroups, and because of the antiquity of these rocks it is most unlikely that worthwhile fossils will be discovered.

In contrast the rocks of the Vryheid Formation of the Eccu Group are renowned for their wealth of plant fossils of the famous Gondwanan *Glossopteris* flora which has been described from Permian-aged rocks. This flora is the source of the coal which is mined from the Vryheid Formation in South Africa.

During the course of this palaeontological environmental impact assessment no fossils were discovered, and because of the absence of rock outcrops in the affected area it is unlikely that fossils will be encountered. The entire area, underlain by the Vryheid Formation, which will be crossed by the proposed pipeline is either covered by grassland or else by ploughed fields. It is thus very unlikely that any fossil heritage will be damaged by activities relating to the installation of the proposed pipeline.

## **Recommendation**

As there are no outcrops of fossil bearing rocks of the Vryheid formation in the path of the proposed pipeline, in my opinion construction of this gas pipeline pipeline will not affect any palaeontological heritage.

Because important plant fossil localities are known close to Vereeniging, excavations for the laying of the pipeline may encounter fossil-bearing rocks of the Vryheid Formation. My survey has indicated that this is unlikely because of thick soil covering the rocks of the Vryheid Formation over most of the area. Although unlikely, if construction activities do expose extensive mudrocks of the Vryheid Formation, it will create a unique opportunity to explore the area for fossils. It is thus recommended that, should fossil bearing mudrocks of the Vryheid Formation be exposed by excavation activities, a qualified palaeontologist be contacted to assess the exposure for fossils.



**Professor Bruce Rubidge**

