6 PROFILE OF THE RECEIVING ENVIRONMENT AND POTENTIAL IMPACTS

This section describes the status quo of the receiving environment, as well as the manner in which the environmental features may be affected (positively or negatively) by the proposed project during the construction and operational phases.

Note that the impacts are only discussed on a qualitative level in this section, whereas a more comprehensive evaluation is provided in **Section 9**.

6.1 General Environmental Description

Status Quo

Given that the sites are close together, a general environmental description can be provided. De Paarl 246 falls in a warm, summer rainfall area. The geology of the area is part of the Bushveld Igneous Complex. The vegetation type of the study area is a transitional ecotone between the Dwaalboom Thornveld and the Madikwe Dolomite Bushveld. This area falls within the Savanna Biome and Central Bushveld Bioregion.

The gradient of the area is level, there are no watercourses, ridges or other environmentally sensitive features in or close to the farm. There are also no areas of cultural or archaeological interest in the three proposed sites.

There is limited development in the area, the land is predominantly used for grazing livestock such as cattle and sheep. An Eskom servitude passes through De Paarl 246.

6.2 Climate

Status Quo

Climatic data, reflected in **Table 5**, was obtained from the South African Weather Service (2008), as measured at the Pilanesberg weather station for a 10-year period (1998 to 2007). Data from the Pilanesberg weather station was used as it is the weather station closest to the three sites.

The area has a warm climate, during the summer months the average temperature is 30℃. The lowest average temperature during winter was 2.88℃ and that was in July.

The area is a summer rainfall area. The lowest rainfall occurs during July and the highest average rainfall is in February, closely followed by December.

Table 5: Climate Data as Measured at the Pilanesberg Weather Station for a ten Year Period (1998 - 2007)

Month	Temperature (℃)			Precipitation (mm)
	Mean	Minimum	Maximum	Monthly Mean
January	24.72	18.40	31.04	106.09
February	24.51	18.12	30.90	119.98
March	23.23	16.31	30.15	72.98
April	20.10	12.47	27.73	28.78
May	15.57	6.31	24.82	13.62
June	13.04	3.70	22.38	3.18
July	12.58	2.88	22.27	0.98
August	16.00	6.54	25.46	2.64
September	20.13	11.17	29.09	3.91
October	23.13	15.54	30.72	55.06
November	23.87	17.05	30.68	66.44
December	24.34	17.88	30.80	112.86

Potential Impact

No foreseen adverse or beneficial effects.

6.3 Geology and Geohydrology

Status Quo

A Geotechnical Specialist Study was undertaken at all three of the alternative sites. The report has been included in **Appendix A** and the findings and recommendations of the report in **Section 7**.

The study area falls within the main zone or the upper zone of the Bushveld Igneous Complex. The Bushveld Igneous Complex falls within the Proterozoic era and the Vaalian eon. The rock types within the study area are felsic in nature. The main zone consists of gabbronorite, norite, pyroxenite or anorthosite (Johnson *et. al*., 2006).

Anorthosite consists almost entirely of the creamy white plagioclase with perhaps some orthopyroxene or clinopyroxene. This rock type is therefore a very light colour (felsic in nature) (Johnson *et. al*., 2006).

Gabbronorite is composed of approximately 50% plagioclase - a creamy white mineral, and the remainder is both orthopyroxene (dark brown, almost black mineral) and clinopyroxene (dark, dirty green, almost black mineral) (Johnson *et. al*., 2006).

Norite is usually composed of almost equal parts of the white plagioclase and the brownish-black orthopyroxene (Johnson *et. al*., 2006).

Both of the above appear very similar, but the Gabbronorite is distinguished by the presence of the greenish clinopyroxene. Both rock types might have clusters of these darker, mafic minerals set within the white plagioclase, or they could also be evenly distributed light and dark minerals (Johnson *et. al*., 2006).

Pyroxenite consists almost entirely of clinopyroxene and orthopyroxene, with less plagioclase. This rock type is much darker (more mafic) than the previous two rock types, and denser (Johnson *et. al*., 2006).

The upper zone has many black magnetite layers within it, which are therefore magnetic, dense and heavy. This zone is characterised by rock types with more than fifty percent plagioclase, therefore it is dominated by gabbronorite and anorthosite, with some rock types like troctolite (which is plagioclase and olivine - a dark green mineral) as well (Johnson *et. al*., 2006).

The soil in the project area has a high clay content; greater or equal to 35% (DEAT, 2006), due to the high clay content the soil is not ideal for cultivation (Mangold, 2002).

The groundwater storage type of the project area is fractured igneous rock. The groundwater recharge rate for the area is 3.0 to 8.0 mm/year (Mangold, 2002).

Potential Impact

Construction Potential contamination of soil and groundwater through:

- Improper management of waste water;
- Improper disposal of waste;
- Incorrect storage of material;
- Spillages from fuel storage and refuelling;
- Spillages of chemicals, oil, paint; and
- Contaminated storm water not disposed off/routed correctly.

Operation Potential contamination of soil and groundwater through:

- Improper management of waste water;
- Improper disposal of waste; and
- Contaminated storm water not disposed off/routed correctly.

6.4 Topography and major land features

Status Quo

There are no major land features in or around any of the three locality alternatives. The general topography is that of level plains with a slope, at all three sites, of less than 5% (AGIS, 2007).

The noticeable features in the area are the existing transmission lines, from which the proposed switching station would draw power.

Potential Impact

No foreseen adverse or beneficial effects.

6.5 Watercourses

Status Quo

There are no watercourses within approximately three kilometres of any of the alternative site locations (**Figure 4**).

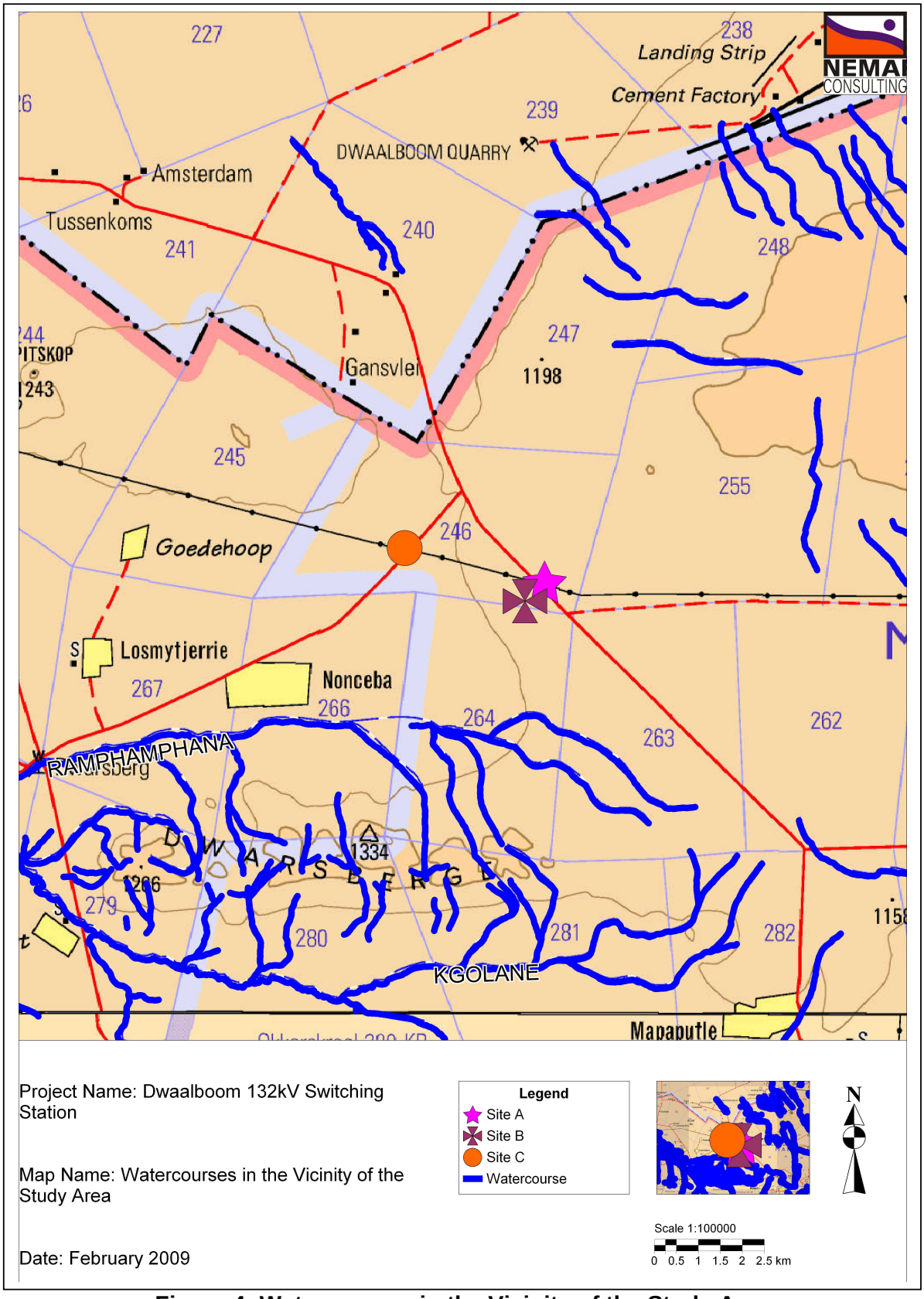

Figure 4: Watercourses in the Vicinity of the Study Area

All three sites fall within the quarternary catchment area A32B (AGIS, 2007).

Potential Impact

Construction Potential contamination of surface water through:

- Improper management of waste water;
- Improper disposal of waste;
- Incorrect storage of material;
- Spillages of chemicals, oil, paint; and
- Contaminated storm water not disposed of/routed correctly.

Operation Potential contamination of surface water through:

- Improper management of waste water; and
- Contaminated storm water not disposed of/routed correctly.

Although a development at this scale is not likely to impact a watercourse that is approximately three kilometres away, the potential impacts as mentioned above will be considered.

At this point it is not certain whether or not the sites would be connected to a municipal stormwater system. This information will be available when the final Environmental Management Plan (EMP) is generated.