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PROPOSED EXTENSION OF THE EXISTING GENERAL WASTE DISPOSAL SITE AND ASSOCIATED INFRASTRUCTURE AT THE TUTUKA POWER STATION, MPUMALANGA

TRAFFIC IMPACT ASSESSMENT

APRIL 2010

ISSUED TO:

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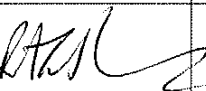



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1 Introduction

1.1 Purpose

WSP SA Civil and Structural Engineers (Pty) Ltd was appointed by Zitholele Consulting to prepare a traffic impact assessment for the proposed extension of the existing general waste disposal site, and associated infrastructure, at the Tutuka Power Station. The purpose of this assessment is to form part of the Environmental Impact Assessment (EIA) that is required prior to undertaking this activity.

The existing waste disposal site has been operating for some time and has now reached capacity. Eskom, who own the site, want to licence the expanded waste disposal site for a further 40 years.

1.2 Locality

Tutuka Power Station is located to the west of the R38 road between Standerton and Bethal approximately 25 kilometres to the north-east of Standerton in Mpumalanga. The subject waste disposal site is located on Eskom property immediately to the west of the power station, the New Denmark Colliery is some 5 kilometres to the north-west of the site and Thutukani Township is located 3 kilometres to the west (see the Locality Plan in Appendix A).

1.3 Scope

The assessment covers the following aspects related to traffic:

- ⌘ A brief description of the proposed development;
- ⌘ An assessment of existing (2009) traffic and road conditions based on direct observations undertaken during an inspection of the roads in the defined study area;
- ⌘ Discussion of trip generation, distribution and assignment associated with the proposal;
- ⌘ Discussion of traffic operating conditions during the critical construction phase, and after the relocation of the infrastructure;
- ⌘ Comment on access arrangements and road improvements;
- ⌘ Comment on road safety issues;
- ⌘ Comment on ongoing road pavement management and maintenance; and
- ⌘ Conclusions and recommendations.

2 Description of the Development

2.1 Background

Throughout the operational life of the Tutuka Power Station general waste, inclusive of garden waste and building rubble, is being generated. This waste is being disposed of in an authorised general waste disposal site within the Tutuka Power Station premises. The current waste disposal site also provides domestic waste disposal services to New Denmark Colliery, Thuthukani Township, selected contractors and some neighbouring farmers. The existing disposal site has reached its capacity and an alternative needs to be implemented.

Two alternative options have been identified: firstly to extend the existing site; and secondly to establish a new disposal site within close proximity. A site selection exercise in line with the Minimum Requirements for the Disposal of Waste by Landfill was undertaken to identify the most suitable alternative.

2.2 Proposed Development

From the above exercise it was concluded that the only feasible options were to either extend the existing site or to establish a new site in close proximity to the power station. It was established that the site must be located on Eskom property, it must not interfere with operations at the Tutuka Power Station or the New Denmark Colliery, it must be within a 2 kilometre radius of the existing site to minimise travelling distance of the waste, and had to have a minimum size of 12 hectares.

The proposal is therefore at this stage to extend the existing site which means that all the infrastructure and support services are in place including roads, security, monitoring boreholes and some fences.

No-Go Alternative

It has also been stated in the Draft Scoping Report that the no-go alternative will also be assessed further in the EIA. In the case that the project does not take place the social, financial and environmental impacts will be assessed and compared with the abovementioned alternatives.

2.3 Existing Road Network

The relevant elements of the existing road network in the vicinity of the study area are also shown on the Locality Plan included herewith in Appendix A and include the following:

- The R39 provincial road from Standerton to Ermelo;
- The R38 provincial road from the R38 to Bethal;
- The district road which runs westward from the R38 past the main entrance to the Tutuka Power Station (see photographs 7-12 in Appendix B); and
- The district road which runs northward from the R39 past the main entrance to the New Denmark Colliery (see photographs 1-6 in Appendix A).

2.4 Potential Impact on Existing Road Network

In general the proposed expansion of the waste disposal site will not have a measurable impact on the existing road network. Neither the R38 nor the R39 are routes that will carry any traffic associated with the proposal. The observed volumes of traffic on the two district roads that will carry traffic generated by the proposal are very low and do not warrant any further analysis.

3 Existing Traffic Characteristics

The R38 and R39 are the only roads in the area that carry any significant volumes of traffic and as stated above they are not in any way affected by the proposal.

Whilst no detailed traffic counts were conducted on the other two roads in the study area the site inspection conducted on 8/02/2010 showed that traffic on these roads is insignificant in terms of volume. As stated earlier the observed hourly volumes of traffic on these two roads are very low and are below the threshold that warrants, or even lend themselves, to detailed analysis.

4 Trip Generation, Distribution and Assignment

The existing waste disposal site operates from 07:00 to 15:45 Monday to Thursday, 07:00 to 15:00 on Friday and 07:00 to 12:00 on payweek Friday.

The waste that requires disposal on the site originates from four main sources:

- Tutuka Power Station domestic and garden waste;
- Tutuka Power Station contractor domestic and building rubble waste;
- Thuthukani Township domestic waste; and
- New Denmark Colliery domestic and garden waste.

It is anticipated that the expanded site will have to take similar volumes of the same type of waste for another 40 years. It is not possible to project trends in passing traffic over such an extended period but given the location of the site it is anticipated that annual growth would be extremely low.

The waste received by the site from the above sources is transported to the site in the following vehicles:

- 3 tonne tractor with skip;
- 6 tonne tipper; and
- 7 tonne truck.

The total number of vehicle trips of the above vehicles is anticipated to be of the order of 5-6 vehicles per day with an annual growth rate of less than 3% per annum. The site inspection mentioned above also indicated a very low volume of other vehicles accessing the site (see photographs 13-20 in Appendix B). These volumes of traffic are below the level of significance for further analysis.

During the construction period the site would initially need to be cleared by a grader after which other construction activities will make use of one grader, two front-end loaders and one compactor. It

is understood that these vehicles will be sourced from the Tutuka Power Station and once on site will remain there for the duration of the construction period with no need to use external roads.

5 Operational Assessment

5.1 Introduction

As discussed earlier traffic volumes on the various elements in the road network in the study area are low and would not normally warrant any detailed analysis in terms of service levels and delay factors

At this point it is worth considering what is meant in terms of levels of service. In this regard the following is an extract from the US Highway Capacity Manual:

“The concept of *level of service* uses qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers. The descriptions of individual levels of service characterize these conditions in terms of such factors as speed and travel time, freedom to manoeuvre, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level of service (LOS) A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions.

The volume of traffic that can be served under the stop-and-go conditions of LOS F is generally accepted as being lower than possible at LOS E, consequently, service flow rate E is the value that corresponds to the maximum flow rate, or capacity, on the facility. For most design or planning purposes, however, service flow rates D or C are usually used because they ensure a more acceptable quality of service to facility users.”

5.2 Analysis Results

As stated above the direct observations undertaken in the study area revealed volumes of traffic that are too low to analyse in terms of Levels of Service. The direct observations indicate that on all critical elements of the roads in the study area the peak levels of service are LOS A. Even if peak hour traffic volumes are doubled, levels of service will remain at LOS A.

The conclusion of the above is that peak period road capacity will not be an issue at any stage and activities associated with the proposal will have no discernable impacts on traffic operating conditions in the vicinity of the site. In this regard therefore there will be no need for any capacity related road improvements in the vicinity.

There are however other traffic issues that will be discussed later in this report.

6 Road Safety Issues

The following can be considered as the issues relevant to road safety:

- Shoulder sight distance;
- Heavy vehicle turning movements; and
- Road surface conditions.

6.1 Shoulder Sight Distance

Shoulder sight distance is the distance that the driver of a vehicle that is stationary at the stop line of a minor road can see along the major road to be able to cross the major road before an approaching vehicle reaches the intersection.

It is therefore a function of the speed of vehicles travelling on the major road, the width of the major road and the type of vehicles that are trying to cross.

The critical shoulder sight distance at the exit from the New Denmark Colliery was measured on site at approximately 300 metres (see photograph 5 in Appendix B). This site distance is only suitable for speeds on the main road of up to 100 km/hour. The speed limits on this stretch of road are a bit confusing as they are not the same for both directions (see photographs 2-4 in Appendix B). Whilst it could be argued that this is not an issue directly associated with the expansion of the waste disposal site, the New Denmark Colliery does generate traffic to and from the site and it is therefore recommended that this situation be remedied by posting the same speed limits for both directions, which based on the critical shoulder site distance should not exceed 100 km/hour. This should however be discussed with the relevant road authority.

The posted speed limit on the road that gives access to the existing waste disposal site and the Tutuka Power Station is 80 km/hour. The shoulder site distances at both exits are more than adequate for this speed (see photographs 9-12 in Appendix B).

6.2 Heavy Vehicle Turning Movements

Notwithstanding the above, it is recommended that W107 and W108 intersection warning signs with IN 11.569 supplementary warning plates be erected on the approaches to all three exits indicating the presence of heavy, and potentially slow moving vehicles, at the intersections.

6.3 Road Surface Conditions

The two tarred roads that will be used by vehicles delivering waste to the disposal site are, from visual inspection, in good to very good condition (see photographs in Appendix B). There are no surface indications of underlying problems, such as sub-standard materials or poor drainage. The ride quality of the surfaces is good and there are no existing conditions that are road safety issues.

7 Road Pavement Management

As stated earlier the tarred roads in the vicinity are generally in good condition for the current daily volumes of traffic that they carry. It must be stressed however that this statement is based only on visual inspection with no investigation of the underlying pavement layers.

The volumes of vehicles generated by the construction and ongoing use of the expanded waste facility should not have a significant impact on the durability of these roads. Having said that, all roads need to be monitored on a regular basis during their lifetimes as part of normal road pavement management programmes. This should not need any extra care associated with the proposal under consideration.

8 Conclusions and Recommendations

8.1 Conclusions

In view of the findings of this assessment, the following conclusions may be drawn:

- (i) Peak hour traffic operating conditions on public roads in the vicinity of the study area will not be significantly affected by the proposal, therefore no mitigation measures should be required.
- (ii) Whilst additional road signs, and specifically heavy vehicle warning signs, are strongly recommended there would not seem to be any significant road safety issues that need to be addressed at this stage. Whilst it is not the direct responsibility of the proponent, the posted speed limits on the road past the entrance to the New Denmark Colliery need to be rationalised, in consultation with the relevant road authority, with a maximum of 100 km/hr in the immediate vicinity of the colliery entrance.
- (i) The two tarred roads in the study area currently appear to be in very good condition although this, as a function of normal road management, needs to be monitored in the long term regardless of the proposal under consideration.

8.2 Recommendations

With respect to roads and traffic there would not seem to be any reason why the proposed expansion of the existing waste disposal site should not be approved.

9 Appendices

Appendix A Locality Plan

Appendix B Photographs of Existing Roads in the Study Area

Appendix A Locality Plan

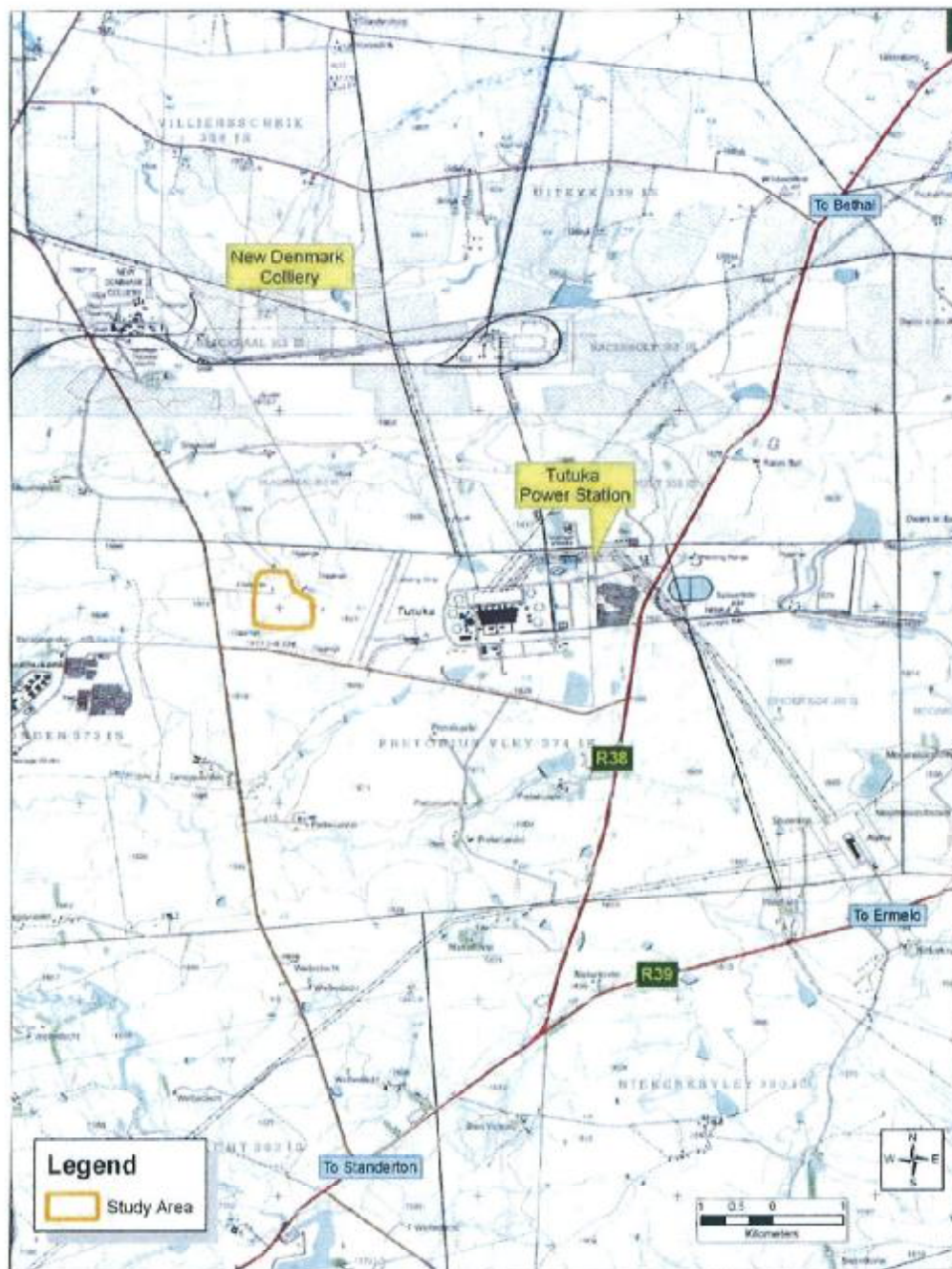




PHOTO 1



PHOTO 2



PHOTO 3



PHOTO 4



PHOTO 5



PHOTO 6



PHOTO 7



PHOTO 8



PHOTO 9



PHOTO 10



PHOTO 11



PHOTO 12



PHOTO 13



PHOTO 14



PHOTO 15



PHOTO 16



PHOTO 17



PHOTO 18



PHOTO 19



PHOTO 20