

REPORT NO.: P 02/B810/00/0608/02 Annexure L

GROOT LETABA RIVER WATER DEVELOPMENT PROJECT (GLeWaP)

Environmental Impact Assessment

(DEAT Ref No 12/12/20/978)

APPENDIX L: TRAFFIC IMPACT ASSESMENT

MARCH 2010



Compiled by: ILISO Consulting

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DECLARATION OF CONSULTANTS' INDEPENDENCE

Bert de Vries and Cobus de Kock, who are Traffic Engineers from ILISO Consulting are independent consultants to the Department of Water Affairs and Forestry, i.e. they have no business, financial, personal or other interest in the activity, application or appeal in respect of which they were appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of these specialists performing such work.

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Traffic Impact Assessment

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EXECUTIVE SUMMARY

The aim of the investigation is to quantify the possible traffic impacts resulting from the proposed raising of the Tzaneen Dam, the construction of a storage dam in the Groot Letaba River and associated bulk water supply infrastructure, on traffic in the area, and to recommend mitigation if required.

The outcome of the investigations is that although there is ample spare capacity on the road network and the relative low volumes of construction vehicles that will utilise the public roads there are some mitigation measure to consider as a result of the project. These are related to public safety, comfort and maintenance issues and comprise construction signage, pavement management and provision of turning lanes at borrow pits and construction sites access intersections.

The construction of the proposed dam in the Groot Letaba River necessitates the realignment of affected roads. Three alternative re-alignments have been proposed of which the shortest route (Alternative 1) is the preferred option form a transportation point of view.

- Farmers and Communities affected will be those along the R529 and the D1292 (R81).
- Vehicles to be used from borrow pits is estimated to be 10 ton per vehicles which make an average number of 10 trips per hour.
- Leratlou River borrow pit site produce 60% and the Merekome River borrow pit site produce 30% of these trips and both sites effect the R529 towards the storage dam in the Groot Letaba River. Additionally the D1292 (R81) is affected with the raising of the Tzaneen Dam wall. However approximately 76% of all material will be within the construction site of the storage dam in the Groot Letaba River and this would therefore not have a noticeable effect on the public roads. The traffic generated by construction ads between 3% and 5% to the daily traffic on the R529.

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ABBREVIATIONS

DWAF	Department of Water Affairs and Forestry
GLeWaP	Groot Letaba River Water Development Project
OA	Options Analysis
PCMT	Project Co-ordination and Management Team
PSP	Professional Service Provider
TIA	Traffic Impact Assessment
LOS	Level of Service
v/c	Volume to Capacity Ratio
ADT	Average Daily Traffic
AADT	Annual Average Daily Traffic
SANRAL	South African National Roads Agency
RAL	Roads Agency Limpopo

1. STUDY INTRODUCTION

1.1 BACKGROUND TO PROJECT

The Department of Water Affairs and Forestry (DWAF) is currently undertaking an Environmental Impact Assessment (EIA) to investigate the environmental feasibility of raising the Tzaneen Dam, the construction of a storage dam in the Groot Letaba River and associated bulk water infrastructure (water treatment, pipelines, pump stations, off-takes and reservoirs) in the Limpopo province. The EIA is being undertaken by ILISO Consulting with Zitholele Consulting providing the public participation support. The EIA is being undertaken according to the EIA Regulations under Section 24 (5) of the National Environmental Management Act (NEMA), (Act No 107 of 1998) as amended in Government Notice R385, 386, 387 – Government Gazette No. 28753 of 21 April 2006.

ILISO Consulting is also undertaking the Traffic Impact Assessment as part of the EIA.

1.2 STRUCTURE OF THIS REPORT

This specialist study has been undertaken in compliance with regulation 33(2) of GN 385. **Table 1.1** indicates how Regulation 33 of GN385 has been fulfilled in this report

Regulatory Requirements	Section of Report
(a) The person who prepared the report; and the expertise of that person to carry out	Chapter 2
the specialist study or specialised process.	
(b) a declaration that the person is independent	Page i
(c) an indication of the scope of, and the purpose for which, the report was prepared	Chapter 3
(d) a description of the methodology adopted in preparing the report or carrying out	Chapter 4
the specialised process	
(e) a description of any assumptions made and any uncertainties or gaps in	Chapter 5
knowledge	
(f) a description of the findings and potential implications of such findings on the	Chapter 7

Table 1.1.Indication of compliance with Regulation 33 in this report

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impact of the proposed activity, including identified alternatives, on the environment	
(g) recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority	Chapter 8
(h) a description of any consultation process that was undertaken during the course of carrying out the study	Chapter 9
(i) a summary and copies of any comments that were received during any consultation process	Chapter 10
(j) any other information requested by the competent authority.	Chapter 11

2. PROJECT TEAM

Cobus de Kock of ILISO Consulting has undertaken the Traffic Impact Assessment. He has a Masters degree in Civil Engineering focussing on Structures and Information Systems. He specialises in Traffic Impact Assessments, Traffic Engineering and Civil Engineering. He has completed Traffic Impact Assessments for developments such as Cape Town International Airport, Cape Town Regional Waste Site and private housing and industrial developments.

Bert de Vries of ILISO Consulting has reviewed the Traffic Impact Assessment. He has a degree in Traffic and Transportation Engineering and a Masters degree in Business Administration. He has 30 years experience in traffic ad transportation projects and has undertaken numerous traffic impact assessments.

3. PURPOSE OF REPORT AND SCOPE OF WORK

The aim of the investigation is to quantify the possible impacts resulting form the proposed raising of the Tzaneen Dam, the construction of a storage dam in the Groot Letaba River and associated bulk water infrastructure, on traffic in the area and to recommend mitigation if required. To achieve this, a good understanding of the current roads and traffic volumes of the sites is necessary and subsequently an understanding of human movement patterns.

Typical specialist investigations were undertaken; seven day classified vehicle count surveys were conducted on possible affected roads.

3.1 SCOPE OF WORK

The following tasks were undertaken:

3.1.1 Baseline Characterisation

This is an investigation in the status quo of the operational traffic along the roads possible affected by the construction of a storage dam in the Groot Letaba River and the raising of the Tzaneen Dam wall.

3.1.2 Impact Assessment

An investigation of the effect the additional construction vehicles will have on the road network from a capacity and the pavement design point of view, as well as an assessment of the effect that the road re-alignments will have on additional travel time to regular users.

4. METHODOLOGY

The impact of the Groot Letaba River Water Development Project will be investigated for the construction and the operational stages. The nature and extent of impact will be described as well as any legal requirements.

4.1 TRAFFIC IMPACT ASSESSMENT

4.1.1 Status Quo

The present traffic in the assessed area is established with traffic count surveys. With this information the status quo situation can be quantified.

4.1.2 Trip Generation

Trip generation estimation is conducted separately for site and non-site traffic. Nonsite traffic includes through traffic that has neither origin nor destination at the site as well as traffic generated by developments within the study area, but outside the specific site under analysis. With calculated assumptions construction trip generation can be estimated for the various phases of this project.

4.1.3 Trip Distribution

The generated trips are distributed over the existing and amended road network according to observed distribution patterns as well as the locations of borrow pits and construction sites. Some of these trips are entering the site while others are leaving the site. Knowledge of the destination of the generated trips is critical to assess to what extent certain roads will be affected.

4.1.4 Impact Assessment

The traffic assessment step determines the amount of traffic that will use certain routes of the roadway network between the site and the surrounding zones (within the influence area). Links of the network will be loaded differentially, depending on the origin and destinations, as well as the traffic conditions on each link. As a result,

some links or the network segments may receive the bulk of the site-generated traffic, while others may receive no additional traffic.

A measure of cost is necessary to perform the assessment: usually, travel time or distance. The use of travel time instead of distance is preferred because it represents actual flow conditions on the network.

4.2 SIGNIFICANCE RATING

The key issues identified during the Scoping Phase informed the terms of references of the specialist studies. Each issue consists of components that on their own or in combination with each other give rise to potential impacts, either positive or negative and form the project onto the environment or from the environment onto the project. In the EIA the significance of the potential impacts will be considered before and after identified mitigation is implemented.

A description of the nature of the impact, any specific legal requirements and the stage (construction / decommissioning or operation) will be given. Impacts are considered to be the same during construction and decommissioning.

The following criteria will be used to evaluate significance:

Nature

The nature of the impact will be classified as positive or negative, and direct or indirect.

Extent and location

Magnitude of the impact and is classified as:

- Local: the impacted area is only at the site the actual extent of the activity
- **Regional**: the impacted area extends to the surrounding, the immediate and the neighbouring properties, local towns and communities.
- **National**: the impact can be considered to be of national importance.

Duration

This measures the lifetime of the impact, and is classified as:

- Short term: the impact will be for 0 3 years, or only last for the period of construction.
- Medium term: three to ten years.
- Long term: longer than 10 years or the impact will continue for the entire operational lifetime of the project.
- **Permanent**: this applies to the impact that will remain after the operational lifetime of the project.

Intensity

This is the degree to which the project affects or changes the environment, and is classified as:

- Low: the change is slight and often not noticeable, and the natural functioning of the environment is not affected.
- Medium: The environment is remarkably altered, but still functions in a modified way.
- **High**: Functioning of the affected environment is disturbed and can cease.

Probability

This is the likelihood or the chances that the impact will occur, and is classified as:

- Low: during the normal operation of the project, no impacts are expected.
- **Medium**: the impact is likely to occur if extra care is not taken to mitigate them.
- **High**: the environment will be affected irrespectively; in some cases such impact can not be reduced.

Confidence

This is the level knowledge/information, the environmental impact practitioner or a specialist had in his/her judgement, and is rated as:

- Low: the judgement is based on intuition and not on knowledge or information.
- **Medium**: common sense and general knowledge informs the decision.
- **High**: Scientific and or proven information has been used to give such a judgement.

Significance

Based on the above criteria the significance of issues will be determined. This is the importance of the impact in terms of physical extent and time scale, and is rated as:

- **Low**: the impacts are less important, but may require some mitigation action.
- **Medium**: the impacts are important and require attention; mitigation is required to reduce the negative impacts
- **High**: the impacts are of great importance. Mitigation is therefore crucial.

Cumulative Impacts

The possible cumulative impacts will also be considered.

Mitigation

Mitigation for significant issues will be incorporated into the EMP for construction.

5. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

In interpreting the study findings it is important to note the limitations and assumptions on which the assessment was based. The most important assumptions of the traffic impact assessment are as follows:

- The trip generation as a result of the construction activities is based on the travel between the borrow pits and the construction site for a 8 hour working day, 5 days a week for 24 months construction time.
- The same borrow pits will be used for the construction of the proposed new dam wall and the raising of the Tzaneen Dam wall.
- The three borrow pits are at the Nwamitwa Dam, Lerwatlou River and the Merekome River. The percentage contribution form the borrow pits is estimated as Namitwa Dam (75.76%), Lerwatlou River (18.18%) and Merekome River (6.06%).
- That a delivery vehicle will transport 6 m³ of material (10 ton payload) from the borrow pits per load.
- Some workers will be skilled migrant workers and accommodation will be provided in Letsitele.
- No traffic surveys were undertaken on the R70, R36, and the R528. Traffic volumes provided by VelaVKE on the roads surrounding the Tzaneen Dam indicated the Annual Average Daily Traffic (AADT) and the Volume-Capacity (v/c) ratio as reported in the Limpopo National Transport Master Plan. The AADT for these roads as counted in 2006 is reported to be in the order of 2500 8000 per day.

6. EXISTING TRAFFIC AND BASELINE CONDITIONS

6.1 THE NEW STORAGE DAM IN THE GROOT LETABA RIVER

6.1.1 Affected Roads

The R71, D1292 (R81), R529 and P43/3 might be affected by construction vehicles for the new storage dam in the Groot Letaba River see **Figure 6.1**. The D1292 (R81), R529 and the P43/3 will also be effected by the extent of the dam basin and therefore have to be realigned (this will be investigated in Chapter 7.3).

7 day 24 hour counting stations were placed on roads described below. The data from these counts provided Average Daily Traffic (ADT) volumes on these roads.



Figure 6.1: Locality Map

R71

The R71 is the main road between Tzaneen and Phalaborwa; this is a surfaced twolane narrow single carriageway with gravel shoulders. According to SANRAL the condition of the road is fair and no upgrading is planned for the near future. Two counting stations were installed in the vicinity of the proposed dam site between 13 November 2007 and 21 November 2007. The outcome of these two stations can be seen in Table 6.1 and 6.2 and Figure 6.1 and 6.2 below. The R71 is a single carriage way road, the capacity of the road is 2 400 vehicle/hr. While the observed peak hour flow is about 350 vehicles per hour. The road has ample capacity to absorb the traffic generated by the dam construction or the traffic generated by the constructed dam. With ADT volumes of between 3121 and 3751 vehicles and heavy vehicles between 10 % and 12.6 % there is ample spare capacity on the R71.

Table 6.1: ADT on the R71 North of the R529

	Daily Volume R71 - (Station P410)					
	Light	Short Heavy	Med Heavy	Long Heavy		
11/13/2007 *	1038	62	49	36		
11/14/2007	3593	271	139	136		
11/15/2007	3952	312	170	131		
11/16/2007	2968	209	68	43		
11/17/2007	2408	125	49	57		
11/18/2007	3287	250	114	119		
11/19/2007	3314	257	157	125		
11/20/2007	3428	306	132	139		
11/21/2007 *	2020	173	87	78		

* Not Full Day Volumes

	R71 - (Station P410) ADT				
	Light	Short Heavy	Med Heavy	Long Heavy	
ADT	3279	247	118	107	

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Figure 6.2: R71 Traffic Volumes North of the R529

Table 6.2: ADT for the R71 South of the R529

		Daily Volume R71 - (Station P413)					
		Light	Short Heavy	Med Heavy	Long Heavy		
11/13/2007							
11/14/2007	*	1437	30	50	123		
11/15/2007		2373	49	109	158		
11/16/2007		3244	62	82	162		
11/17/2007	*	1743	16	21	41		
11/18/2007							
11/19/2007							
11/20/2007							
11/21/2007							

* Not Full Day Volumes

	R71 - (Station P413) ADT				
	Light	Short Heavy	Med Heavy	Long Heavy	
ADT	2809	56	96	160	

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Figure 6.3: R71 Traffic Volumes South of the R529

D1292 (R81)

The D1292 (R81) is the link between the proposed dam site and Tzaneen, this is a surfaced two-lane narrow single carriageway with gravel shoulders. According to SANRAL the condition of the road is fair and no upgrading is planned for the near future. This also links Tzaneen with the Nkamboko and Nwamitwa communities. A counting station was installed in the vicinity of the proposed dam site between 13 November 2007 and 21 November 2007. The D1292 (R81) is a single carriage way road, the capacity of the road is 2 400 vehicle/hr. While the observed peak hour flow is about 250 vehicles per hour. The road has ample capacity to absorb the traffic generated by the dam construction or the traffic generated by the constructed dam. The ADT for this road is 3153 vehicles of which 12.2 % is heavy vehicles (see **Table 6.3** and **Figure 6.3**.) There is spare capacity on the D1292 (R81).

Table 6.3: ADT for the D1292 (R81)

	Daily Volume D1292 (R81) - (Station P408)				
	Light	Short Heavy	Med Heavy	Long Heavy	
2007/11/13 *	1556	107	76	80	
2007/11/14	2607	162	124	140	
2007/11/15	2686	184	118	120	
2007/11/16	3308	226	135	123	
2007/11/17	3162	200	53	78	
2007/11/18	2400	128	41	23	
2007/11/19	2697	176	118	119	
2007/11/20	2521	171	133	121	
2007/11/21 *	841	43	36	47	

* Not Full Day Volumes

	R81 (Station P408) ADT				
_	Light	Short Heavy	Med Heavy	Long Heavy	
ADT	2769	178	103	103	



Figure 6.4: D1292 (R81) Traffic Volumes

R529

The R529 is the link from the R71 in a northern direction through the proposed Nwamitwa dam basin, this is a surfaced two-lane narrow single carriageway with gravel shoulders. Two counting stations were installed in the vicinity of the proposed dam site between 13 November 2007 and 21 November 2007. The R529 is a single carriage way road, the capacity of the road is 2 400 vehicle/hr. While the observed

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peak hour flow is about 250 vehicles per hour. The road has ample capacity to absorb the traffic generated by the dam construction or the traffic generated by the constructed dam. With ADT volumes of 2 747 and 2 894 vehicles and heavy vehicles percentage of 11.7% and 10.9%, there is ample spare capacity on the R529.

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Daily Volume D1292 (R81) - (Station P407)					
	Light	Short Heavy	Med Heavy	Long Heavy	
2007/11/13 *	1644	68	52	69	
2007/11/14	2317	169	134	97	
2007/11/15	2458	156	97	73	
2007/11/16	2992	223	115	98	
2007/11/17	2548	133	50	61	
2007/11/18	1900	95	34	29	
2007/11/19	2457	150	102	83	
2007/11/20	2308	167	101	85	
2007/11/21 *	569	31	18	28	

* Not Full Day Volumes

	D1292 (R81) (Station P407) ADT				
	Light	Short Heavy	Med Heavy	Long Heavy	
ADT	2426	156	90	75	



Figure 6.5: R529 Traffic Volumes North of the D1292 (R81)

i						
	Daily Volume R529 - (Station 409)					
	Light	Short Heavy	Med Heavy	Long Heavy		
11/13/2007 *	1288	69	30	45		
11/14/2007	2578	124	101	117		
11/15/2007	2614	165	95	108		
11/16/2007	3136	201	95	102		
11/17/2007	2684	174	36	64		
11/18/2007	1901	93	32	32		
11/19/2007	2638	129	111	99		
11/20/2007	2503	130	98	103		
11/21/2007 *	1053	55	51	58		

Table 6.5: ADT for the R529 South of the D1292 (R81)

* Not Full Day Volumes

	R529 - (Station 409) ADT				
	Light	Short Heavy	Med Heavy	Long Heavy	
ADT	2579	145	81	89	



Figure 6.6: R529 Traffic Volumes South of the D1292 (R81)

P43/3

The P43/3 is the road to the South of the proposed dam basin, this is a surfaced twolane narrow single carriageway with gravel shoulders. A counting station was installed in the vicinity of the proposed dam site between 13 November 2007 and 21

November 2007. The P43/3 is a single carriage way road, the capacity of the road is 2 400 vehicle/hr. While the observed peak hour flow is about 120 vehicles per hour. The road has ample capacity to absorb the traffic generated by the dam construction or the traffic generated by the constructed dam. An ADT volume of 1264 vehicles and heavy vehicle percentage of 10%, there is ample spare capacity on the P43/3.

Table 6.6: ADT for the P43/3	
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	Daily Volume P43/3 - (Station P412)					
	Light	Short Heavy	Med Heavy	Long Heavy		
11/13/2007 *	114	0	9	2		
11/14/2007	1061	42	46	39		
11/15/2007	1182	63	54	32		
11/16/2007	1388	81	78	22		
11/17/2007	1085	45	27	15		
11/18/2007	899	32	5	4		
11/19/2007	1188	57	46	34		
11/20/2007	1147	69	74	32		
11/21/2007 *	648	28	34	16		

* Not Full Day Volumes

	P43/3 - (Station P412) ADT				
	Light	Short Heavy	Med Heavy	Long Heavy	
ADT	1136	56	47	25	

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Figure 6.7: P43/3 Traffic Volumes

6.2 THE RAISING OF THE TZANEEN DAM WALL

6.2.1 Affected Roads

The R70, R36, and the R528 are the major road network surrounding the Tzaneen Dam (see **Figure** 6.1). Traffic volumes provided by VelaVKE on the roads surrounding the Tzaneen Dam indicated the Annual Average Daily Traffic (AADT) and the Volume-Capacity (v/c) ratio as reported in the Limpopo National Transport Master Plan.

The AADT for these roads as counted in 2006 is reported to be in the order of 2500 – 8000 per day. The peak hour traffic can be estimated to be in the order of 10% of the AADT. This is equivalent to a peak hour in the order of 250 to 800 vehicles on a link road. The v/c for these roads is reported to be in the order of 0.16 - 0.33. This results in only 25% of the road being utilised.

It can therefore safely be assumed that there is ample spare capacity on the road network surrounding the Tzaneen Dam.

6.3 THE ASSOCIATED BULK INFRASTRUCTURE

6.3.1 Affected Roads

Due to the nature and proximity of this related bulk infrastructure, such as reservoirs and pipelines (see **Figure 6.8**), it is estimated that the same roads as for the storage dam in the Groot Letaba River will be affected. In addition local access roads to villages will also be affected. However due to the unknown locations of all the reservoirs and precise alignment of the bulk water pipelines as well as the fact that these construction sites will generate very limited additional traffic, it was not investigated in detail for the purpose of this report. The impact on the road network due to this component of the project will be more of a localised construction nature, the effect on the local roads has to be minimised by normal construction traffic accommodation measures.



Figure 6.8: Project Components

7. FINDINGS

7.1 TRIP GENERATION

Assumptions needed to be made to establish the effect that the construction process will have on the local road networks. Due to all the uncertainties related to the construction process of the proposed new storage dam and the raising of the Tzaneen Dam wall the assumptions are:

- The trip generation as a result of the construction activities is based on the travel between the borrow pits and the construction site for a 8 hour working day, 5 days a week for 24 months construction time.
- The same borrow pits will be used for the construction of the proposed new dam wall and the raising of the Tzaneen Dam wall.
- The three borrow pits are at the Nwamitwa Dam, Lerwatlou River and the Merekome River. The percentage contribution form the borrow pits is estimated as Namitwa Dam (75.76%), Lerwatlou River (18.18%) and Merekome River (6.06%).
- That a delivery vehicle will transport 6 m³ of material (10 ton payload) from the borrow pits per load.
- Some workers will be skilled migrant workers and accommodation will be provided in Letsitele which is 20km from the proposed new storage dam wall.

Table 7.1 shows trip generation from the borrow pits and the worker related trip generation. It is assumed that the required number of construction vehicles required will stay onsite till decommissioning and that the only construction related vehicles will be the 10 ton tipper trucks that will transport fill from the borrow pits at Lerwatlou River and Merekome River. These two borrow pits are located between the R529 and the P43/3. Therefore either of these two roads can be utilised to haul fill to the sites.

Table 7.1: Trip Generation

Assumptions	Borrow Pit	Percentage	
	Nwamitwa Dam	75.76%	
	Leratlou River	18.18%	
	Merekome River	6.06%	
	Loaded Vehicle	6	m ³

Construction Trips	Total Constuction Volume Req m ³	Borrow Pit Volume Req m ³	Total Trips	Construction Time (Months)	Trips per Month	Trips per Day	Trips per Hour
Tzaneen Dam	18375	18375	3063	12	255	12	2
Nwamitwa Dan	990000	239976	39996	24	1666.5	79	10

Workers	Construction Time	Taina
l rips	(Months)	l rips
Tzaneen Dam	12	50
Nwamitwa Dan	24	50

7.2 EFFECT ON THE ROAD NETWORK

The roads affected by construction vehicles are the R529 and D1292 (R81) and possibly the P43/3 which links the borrow pits at Leratlou River and Merekome River to both proposed construction sites. With the assumptions as described in section 7.1 these will be on average 12 vehicles per from the borrow pits on the public roads. Due to this low estimated volume of construction traffic and the ample spare capacity of the road network it is deemed that the effect of the construction will be of Low impact on the roads network.

7.3 EFFECT ON THE ROAD PAVEMENT

The current road surfaces has been indicated to be fair by SANRAL but due to the heavy loads associated with construction traffic the effect this will have on the pavement it is proposed that a Pavement Assessment is done prior to the construction commences. It is also proposed that the pavement structure is constantly assessed throughout the construction period via a Pavement Management System and that remedial work is done if required.

7.4 ADDITIONAL TRAVEL TIME

Due to the extent of the proposed dam basin the following roads, D1292 (R81), R529 and the P43/3 will have to be realigned and this will have travel time implications. The least effected road alignment is that of the P43/3, this road will have a few minor changes which are insignificant. The re-alignment of the R529 and D1292 (R81) are not finalised at this stage. There are four proposed alternatives (see **Figure 7.1**) of which Alternative 4 has the least amount of impact. The initial indications show that there is no additional distance for the R529 after the dam has been constructed. Alternative 1 has an additional 780m, Alternative 2 has an additional 1.6 km and Alternative 3 has an additional 7.07 km in comparison to the existing alignments. The effect on the local farmers might be additional travel distance and time over and above the above distances to shuttle farm or factory workers to the surrounding villages. The social impacts the road re-alignment has can be seen in the Social Impact Assessment. The effect for traffic on the R529 travelling at 100 km/h, the additional time should not be more than five minutes of travel time for Alternative 3 which is the worst case scenario.



Figure 7.1: Alternative Road Re-Alignments

7.5 IMPACT TABLES

7.5.1 The New Storage Dam in the Groot Letaba River

	New Storage Dam in the Groot Letaba River				
Description of potential impact	Additional Traffic on the Roads Network				
Nature of impact	Additional slow moving construction vehicles can cause delays to regular road users.				
Legal requirements	None				
Stage	Construction and decommissioning	Operation			
Nature of Impact	Negative – Indirect	None			
Extent of impact	Regional – Construction Traffic on the R529 and the P43/3	None			
Duration of impact	Short Term – Construction Period	None			
Intensity	Low	None			
Probability of occurrence	High	None			
Confidence of assessment	High	None			
Level of significance before mitigation	Low	None			
Mitigation measures (EMP requirements)	Construction Signage as part of the project by the Contractor N/A				
Level of significance after mitigation	Low	N/A			
Cumulative Impacts	None	None			

Comments or Discussion

The additional construction traffic is estimated to be minimal in relation to the existing traffic volumes on the affected roads. An average of 12 vehicles per hour in addition to the existing peak hour of 250 vehicles per hour, the roads have sufficient capacity to deal with the additional traffic. Although the additional traffic might have a negative effect on the average speed on these this is not considered to be a major issue due to the low volumes on the roads. The affected parties with be the general public travelling on the roads network.

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7.5.2 The Raising of the Tzaneen Dam Wall

	Raising of the Tzaneen Dam Wall	
Description of potential impact	Additional Traffic on the Roads Network	
Nature of impact	Additional slow moving construction vehicles can cause delays to regular road users.	
Legal requirements	None	
Stage	Construction and decommissioning	Operation
Nature of Impact	Negative – Indirect	None
Extent of impact	Regional – Construction Traffic on the R71 and the D978	None
Duration of impact	Short Term – Construction Period	None
Intensity	Low	None
Probability of occurrence	High	None
Confidence of assessment	High	None
Level of significance before mitigation	Low	None
Mitigation measures (EMP requirements)	Construction Signage as part of the project by the Contractor	N/A
Level of significance after mitigation	Low	N/A
Cumulative Impacts	None	None

Comments or Discussion

The additional traffic is estimated to be minimal in relation to the existing traffic volumes on the affected roads. The roads have sufficient capacity to deal with the additional traffic. Although the additional traffic might have a negative effect on the average speed on these this is not considered to be a major issue due to the low volumes on the roads.

7.5.3 Effect of Construction Vehicles in the Pavement

	Effect of Construction Vehicles on the Pavement	
Description of potential impact	Additional Heavy Construction Vehicles on the Local Roads	
Nature of impact	Additional heavy construction vehicles can cause failure to the road structure and therefore have negative effects for all road users	
Legal requirements	None	
Stage	Construction and decommissioning	Operation
Nature of Impact	Negative – Indirect	None
Extent of impact	Regional – Construction Traffic on the R529, D1292 (R81), D978 and the P43/3	None
Duration of impact	Short Term – Construction Period	None
Intensity	Low	None
Probability of occurrence	Medium	None
Confidence of assessment	Medium	None
Level of significance before mitigation	Low	None
Mitigation measures (EMP requirements)	Monitoring and Remedial Road Works if Required by DWAF and the Responsible Road Authority	N/A
Level of significance after mitigation	Low	N/A
Cumulative Impacts	None	None

Comments or Discussion

The current road condition is reported to be in a fair condition according to the South African National Roads Association (SANRAL). The additional heavy vehicle movements on the roads will accelerate the deterioration of roads used by construction traffic. The road condition should be monitored with a pavement management system and remedial action taken when required. This responsibility resides with DWAF and the responsible road authority (SANRAL or RAL)

	Road Realignment due to Storage Dam Basin	
Description of potential impact	Realignment of the R529 and the D1292 (R81) due to the extent of the dam basin	
Nature of impact	Additional travel time and distance will be added to residents and travellers after the construction of the dam has finished.	
Legal requirements	None	
Stage	Construction and decommissioning	Operation
Nature of Impact	Negative – Indirect	Negative – Indirect
Extent of impact	Regional – Additional travel time and distance on the R529 and the D1292 (R81)	Regional – Additional travel time and distance on the R529 and the D1292 (R81)
Duration of impact	Short Term – Construction Period	Permanent
Intensity	Medium	Medium
Probability of occurrence	Definite	Definite
Confidence of assessment	Medium	Medium
Level of significance before mitigation	Low	Low
Mitigation measures (EMP requirements)	None	None
Level of significance after mitigation	Low	Low
Cumulative Impacts	None	None

7.5.4 Road Realignment due to New Storage Dam Basin

Comments or Discussion

Alternative 4 results in the least amount of additional travel time and distance for general traffic along the R529 and is therefore the preferred alignment from a traffic operational point of view. However other considerations might be identified through the other specialist assessment reports (SIA, VIA, HIA, NIA, BIA ect).

8. **RECOMMENDED MITIGATION MEASURES**

8.1 PAVEMENT MONITORING SYSTEM

Objective

The objective is to minimise the damage to the affected roads.

Target

The target is to maintain the roads at the current operational conditions.

Method

Due to the increased activity of heavy construction vehicles on the roads network it is proposed that a pavement monitoring system is used to assess road condition on an ongoing bases and that remedial work to the roads will be done to minimise the effect of the construction traffic. This responsibility resides with DWAF and the responsible road authority (SANRAL or RAL).

8.2 ADDITIONAL TURNING LANES

Objective

The objective is to maintain good Level of Service at the access intersection to the constructing sites and the borrow pits.

Target

The target is to ensure safety and to minimise delays for the general traffic on the affected roads.

Method

Due to the increased activity of heavy construction vehicles on the roads network it is proposed that turning lanes are provided to minimise the conflict points with the general road users. These turning lanes should to be at the intersections with the access roads to borrow pits and construction sites. These will be permanent on access roads maintained after construction. These lanes should be built as part of the contract.

8.3 CONSTRUCTION SIGNAGE

Objective

The objective is to warn the general public of construction traffic.

Target

The target is to ensure road safety along the public roads and to increase awareness of slow moving vehicles.

Method

Due to the public nature of the roads it is recommended that adequate construction signage is in place to inform the public of increased construction activities in the affected areas by placing adequate legal and required signage. Construction signage should be installed by the contractor as part of the contract.

9. CONSULTATION PROCESS

Engagement with Interested and Affected Parties (I&APs) forms an integral component of the EIA process. I&APs have an opportunity at various stages throughout the EIA process to gain more knowledge about the proposed project, to provide input into the process and to verify that their issues and concerns have been addressed.

The proposed project was announced in July 2007 to elicit comment from and register I&APs from as broad a spectrum of public as possible. The announcement was done by the following means:

- the distribution of Background Information Documents (BIDs) in four languages,
- placement of site notices in the project area,
- publishment of advertisements in regional and local newspapers,
- publishment of information on the DWAF web site,
- announcement on local and regional radio stations; and
- the hosting of five focus group meetings in the project area.

Comments received from stakeholders were captured in the Issues and Response Report (IRR) which formed part of the Draft Scoping Report (DSR). The DRS was made available for public comment in October 2007. A summary of the DSR (translated into four languages) was distributed to all stakeholders and copies of the full report at public places. Two stakeholder meetings were held in October to present and discuss the DSR. The Final Scoping Report was made available to stakeholders in December 2007.

The Draft Environmental Impact Assessment Report, its summary (translated in four languages), the various specialist studies, the Environmental Management Plans and Programmes were made available for a period of thirty (30 days) for stakeholders to comment. Stakeholder comments were taken into consideration with the preparation of the final documents. The availability of the final documents will be announced prior to submission to the decision-making authority.

10. COMMENTS RECEIVED

ISSUES RELATED TO ACCESS AND ROAD RE-ALIGNMENT			
Issue	Raised By	Source	
a. That the alignment of the roads will make access for labourers and workers very difficult – how will they travel to their work places which might be on the other side of the proposed dam?	Lady Chief Nwamitwa, Member of Parliament.	Attendance at meeting at Nwamitwa Tribal office, 1 August 2007.	
b. That the distance from homes and work places will increase and that it will result in additional costs for transport. Subsidisation for transport need to be considered.	Lady Chief Nwamitwa, Member of Parliament.	Attendance at meeting at Nwamitwa Tribal office, 1 August 2007.	
 c. That early / timeous communication with villagers take place so that proper planning can be done to ensure that should relocation have to take place, access to work places and Tzaneen be considered and addressed. Presently the distance from Nwamitwa to Tzaneen is 	Lady Chief Nwamitwa, Member of Parliament.	Attendance at meeting at Nwamitwa Tribal office, 1 August 2007.	
approximately 39km and if relocation will take place, the distance will			
increase.			
 d. That issues of transportation and access should be thoroughly investigated as it might affect farm workers in terms of production and transport arrangements. Most farm workers travel from their homes to farms where they work on a daily basis. Access is also important to schoolchildren – when existing rivers are full, children miss a school day, with the proposed dam the problem might increase. 	BC (Burgert) van Rooyen, Group 91 Export. Mr Ngobeni, Ms Mashele and Mr Nkuna, Nkambako village and Rwanda village.	Written submission (BID comment sheet) and attendance at meeting at Groot Letaba Water User Association offices, 31 July 2007 and Nwamitwa Tribal office, 1 August 2007. Site visit by the Social Impact Assessment Team.	

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<u> </u>	T		
e.	I hat farmers down stream should be	Piet Vorster, Chairperson -	Written submission (BID
	planning of road realignment.	Constantia Farmers' Union,	comment sheet) and
		Letsitele and several other	attendance at meeting at
		members of the union.	Letaba Junction on 1 August
			2007.
			Attendance at a public
			meeting 12 October 2007,
			Tzaneen.
f.	That information must be supplied	P (Peter) Faul, Landowner,	Written submission (BID
	about how the D1267 Road will be	Riverside.	comment sheet) and
	realigned.		attendance at meeting at
			Letaba Junction on 1 August
			2007.
g.	That if the project involves the	Dr Matome Masipa, Department	Attended meeting at
	movement of a community it will	of Health and Social	Fairview Country Lodge, 31
	Department of Health and related	Development, Limpopo.	July 2007, Tzaneen.
	organisations are delivering (clinics).		
	Therefore Health needs to be		
	with regards to roads as it impacts		
	on emergency services.		
h.	Where the Eiland road might be	Some of the landowners in the	Site visit by the Social
	not be re-aligned but a soil dam wall	project area.	Impact Assessment Team.
	should be considered to		
	accommodate the current alignment.		
	This will decrease travelling		
	tractors round sharp bends, which		
	will be a reality should soil dams not		
	be possible.	Come of the landours in the	Cito visit by the Cariel
^{1.}	alignment will result in an increase in		
	traffic to Nwamitwa. Already there	project area.	impact Assessment Team.
	are too many accidents. A traffic light		
	and speed bumps will have to be considered		
j.	That it should be considered that the	Some of the landowners in the	Site visit by the Social
	gravel road from Mandakhazi to	project area.	Impact Assessment Team.
k	That the re-alignment could include	Some of the landowners in the	Site visit by the Social
``.	tarring the road from Msipane Health	nroject area	Impact Assessment Team
	Centre to the road that is being		mpaol Assessment reall.
	tarred between Nwamitwa and ka		
١.	That no new roads should be built	Some of the landowners in the	Site visit by the Social
	near existing houses, as this will	project area.	Impact Assessment Team
	negatively impact on peace and		
l I	quiet.		

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m. That all encroachment on provincial road reserved must be approved by the Limpopo Roads Agency before work is carried out within the road reserves	Mbhazima Thomas Shivambu, Roads Agency Limpopo, Polokwane.	Written submission (BID comment sheet).
 n. That the R529 should be re-aligned on an existing servitude road on La Gratitude North towards the D1292 (R81) and join between Karibu and De Nysschen – only one bridge has to be built over Taganashoek River. This option will have the least effect on the orchards on La Gratitude , Riverside, Taganashoek and Janetsi. 	Mr Peter Faul, Landowner, Riverside 514 LT and La Gratitude 28. Mr Koos de Nysschen, landowner.	Written submission (DSR comment sheet) and attendance of the public meeting on 12 October 2007 in Tzaneen.
As a second alternative: No change to the road, only use the existing Letsitele Road.		
 That Constantia farmers will be severely effected by the re-alignment of roads – please include us in the planning process. 	Mr Pieter Voster, Chairman, Constantia Farmers Association (Agri-Letaba), Letsitele.	Written submission (DSR comment sheet) and attendance of the public meeting on 12 October 2007 in Tzaneen.
p. That all encroachment on provincial road reserved must be approved by the Limpopo Roads Agency before work is carried out within the road reserves.	Mbhazima Thomas Shivambu, Roads Agency Limpopo, Polokwane.	Written submission (BID comment sheet).

11. OTHER INFORMATION REQUESTED BY THE AUTHORITY

No specific requests have been raised by the authority.

12. CONCLUSION

The impact that the construction of the proposed storage dam in the Groot Letaba River, the raising of the Tzaneen Dam Wall and the associated bulk water supply Infrastructure, has on the roads network is generally deemed to be a short term, low intensity but a high probability effect. Due to the ample spare capacity of the roads network and the relative low (12 vehicles per hour) volumes of construction vehicles that will utilise the public roads it is considered to be of low significance as a whole.

There are four proposed alternative alignments however Alignment 4 is the preferred re-alignment. This re-alignment has the lease amount of impact on traffic form a time and distance point of view.