MERCURY – PERSEUS 400 Kv TRANSMISSION LINE

SURFACE WATER RESOURCES AND WETLANDS

ADDENDUM TO SPECIALIST REPORT:

ALTERNATIVE 4

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1. INTRODUCTION

Strategic Environmental Focus was appointed by ESCOM to investigate the surface water resources, as well as the potential impacts on these resources, on the three alternative routes proposed for the Mercurius – Perseus 400 kV transmission line, running between Vierfontain and Dealesville in the Western Freestate. Based on a scoping report and associated specialist studies, it was decided that Route 1 was the most feasible option from an environmental point of view. Subsequent to the public participation process undertaken as part of the impact assessment of this project, Alternative 4 was identified as a potential alignment for the transmission line. The following report details site specific impacts and mitigating measures relevant to Route 4 to be applied to the construction and operational phase of this project.

2. AQUATIC HABITATS ON ROUTE 1

Three types of wetlands are situated on or in close proximity to the preferred route. These are:

1. Endoreic Pans;
2. Rivers and associated palustrine wetlands; and
3. Man made dams.

The position of these wetlands relative to the preferred route is indicated in Figure 1.

2.1. Endoreic Pans

A total of 16 Endoreic pans occur in close proximity of the proposed route. Fifteen occur between Dealseville and Wesselsbron, while only one occur between Wesselsbron and Vierfontein.

2.2. Streams, Rivers and associated palustrine wetlands.

The Vals River will be crossed adjacent to its confluence with the Vaal River, approximately 10 kilometres west of Bultfontein. Although a substantial riparian zone is found at the crossing site, another powerline already cross here, and the area have been substantially degraded due to human activities. Alien invasive species is present at the site, as a result of the degraded state.

The Vet River will be crossed approximately 40 kilometres west of Wesslesbron. The crossing point is characterised by the presence of a wetland on the northern part of the Vals River in the form of a substantial floodplain area.

The Sand Spruit is crossed approximately halfway between the Vals and Vet Rivers. The area is characterised by a substantial marsh area at the crossing point.

Two ephemeral rivers are crossed between Wesslesbron and Vierfontein. These streams do not have substantial palustrine wetlands associated with them, as they only hold water during storm events. Subsurface water would

however be expected, judged by the presence of some reeds in these streams.

2.3. Man Made Wetlands

A total of 10 earth dams are situated in close proximity to Route 4. Although man made, these dams do act as wildlife habitat, specifically to certain waterfowl, and therefore is an important component of the habitat mosaic of the western Freestate.

3. SPECIFIC MITIGATING MEASURES

The area of specific importance from a wetlands point of view is the pans to be passed where Alternative 4 joins Alternative 1, halfway between Dealesville and Bultfontein, as well as the marshy areas at the Vet River crossing. These areas are indicated with red arrows (I and II) in Figure 1. Under all circumstances the mitigating measures mentioned in the Surface Water and Wetlands Specialist Study should be adhered to and applied to this preferred alternative. In addition to these the following is also required.

3.1. Endoreic Pans

1. No access should be allowed into any of the endoreic pans by the workforce or equipment for construction or maintenance activities.
2. A no-go buffer zone of 75 metres should be recognized around each pan.
3. Under extraordinary circumstances, which do not allow for any viable alternatives, the ECO and the relevant engineer should be informed of access into this buffer zone or a pan and a motivation furnished for this access by the relevant contractor.
4. Access into the pan or buffer zone, should only be allowed, once the ECO have approved this.
5. The contractor should be held responsible for any environmental rehabilitation that may be required afterwards, on recommendation of the ECO.

3.2. Streams, Rivers and associated palustrine wetlands.

1. Access into the riparian zone and floodplains of all streams and rivers on the route should be limited under all conditions to a single access road. No deviation should be allowed from this route.
2. Should access into other wetland areas, which is not associated with a stream or river, be required, a single route should also be used. Such routes should be rehabilitated after construction is finalised, unless the route will be used for maintenance activities.
3. The preferred route should be identified and pegged out, before construction commences by the ECO in consultation with the resident engineer.
4. Where possible, this access road should also be used as the access route for maintenance activities.

5. The preferred route should therefore have the least impact on the environment, with special reference to erosion, compaction, sedimentation, destruction of indigenous flora and faunal disturbance.
6. Contractors should be held liable for rehabilitation of any route's deviating from the identified route.
7. Under extraordinary circumstances, which do not allow for any viable alternatives, the ECO and the relevant engineer should be informed of deviation from the preferred route and a motivation furnished for this deviation by the relevant contractor.

4. MONITORING AND AUDITING OF SURFACE WATER RESOURCES

The monitoring programme is designed to be implemented in two phases. Phase 1 is to be undertaken during the pre-construction phase and phase 2 during the operational or post construction phase. This monitoring should be undertaken by an independent specialist aquatic scientist, which has the relevant experience in biomonitoring and surface water quality analyses and interpretation. The monitoring programme is summarised in Table 1 below.

Table 1. Aquatic monitoring programme

Phase 1: Pre-construction		
When	**Where**	**What**
No longer than <u>two weeks</u> before construction to commence at a specific crossing site.	A site, no further that 500 metres upstream of any crossing point on a river / stream.	Biomonitoring: 1. South African Scoring System v. 5 (SASS 5); 2. Integrated Habitat Assessment System v 4 (IHAS). Water Quality: 1. pH; 2. Conductivity; 3. Total Dissolved Solids; 4. Total Suspended Solids; and 5. Temperature
	A site, no further than 500 metres downstream of any crossing point on a stream / river.	Biomonitoring: 1. South African Scoring System v. 5 (SASS 5); 2. Integrated Habitat Assessment System v 4 (IHAS). Water Quality: 1. pH; 2. Conductivity; 3. Total Dissolved Solids;

		4. Total Suspended Solids; and 5. Temperature

Phase 2: Post Construction / Operation		
When	**Where**	**What**
No longer than one week after construction at a specific crossing site have been finished.	The same site, used during the pre-construction monitoring programme, upstream of the crossing point.	Biomonitoring: 1. South African Scoring System v. 5 (SASS 5); 2. Integrated Habitat Assessment System v 4 (IHAS). Water Quality: 1. pH; 2. Conductivity; 3. Total Dissolved Solids; 4. Total Suspended Solids; and 5. Temperature
	The same site, used during the pre-construction monitoring programme, downstream of the crossing point.	Biomonitoring: 1. South African Scoring System v. 5 (SASS 5); 2. Integrated Habitat Assessment System v 4 (IHAS). Water Quality: 1. pH; 2. Conductivity; 3. Total Dissolved Solids; 4. Total Suspended Solids; and 5. Temperature
	The construction area and associated access road.	Visual inspection for: 1. Erosion; 2. Soil compaction; 3. Litter; 4. Dumped building rubble; and 5. Chemical / fuel / concrete spills.

5. CONCLUSIONS

Compared with the rest of the alternatives as identified previously, Alternative 4, as discussed here, would result in the least impacts on the surface water resources and is therefore the preferred alignment. This is due to the limited number of surface water bodies to be crossed, by this alternative alignment. The impacts can however still jeopardise the ecological functioning of the wetlands if care is not taken during the construction and operational phase of this project. Implementation of the mitigating measures as discussed in this addendum, would however limit these impact to acceptable levels.