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Department of Water and Sanitation

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Attention: Mr. W. Dreyer

DWS RISK ASSESSMENT MATRIX APPLIED TO THE PROPOSED DEVELOPMENT OF A DAM AND ASSOCIATED INFRASTRUCTURE LOCATED ON PORTION 3 AND PORTION 5 OF THE FARM VAN DER WATTSKRAAL 394, NEAR RIVIERSONDEREND WITHIN THE WESTERN CAPE PROVINCE

The Risk Assessment Matrix as required in terms of GA 509 gazetted on the 26th of August 2016 has been completed by Louise Zdanow (SACNASP Reg. no. 114072). Please refer to signature at the bottom of this letter for contact details.

Summary of proposed activities.

The current owner of Portion 5 of the farm Van der Wattskraal 394 proposes the cultivation of a variety of nuts as part of a Broad-Based Black Economic Empowerment (BBBEE) project. In order for the project to prove feasible irrigation will be required for the approximately 55ha earmarked for orchards. The water requirements will be met with the use of water abstracted from a natural watercourse at the Eksteenskloof weir located on the adjacent property (remaining extent of Farm 234). The Eksteenskloof weir requires reconstruction following a flood event in 2008. The water will be piped from the weir to the Hut dam that will be constructed approximately 300m south east of the Eksteenskloof weir within a natural watercourse. Water will only be abstracted during winter, which will ensure downstream aquatic habitat will receive adequate water volumes during the remainder of the year.

The proposed reconstruction of the weir will entail the rehabilitation of a steel-reinforced concrete weir with piped outlet works. The weir will have a maximum height of ±2,2m, a total length in the order of ±35m and a top width of ±300mm. It will be based on a foundation of about 3,6m wide and will also be equipped with a downstream flush valve. The construction site will include the total footprint of the weir including related small works on the side as well as a maximum 2m wide workspace along the length of the weir. Since the size of works is relatively small, not much extra area outside the 2m construction strip would be necessary except for the area where operators would be able to park vehicles as near as possible to the site.

The proposed dam will involve the construction of a zoned earth fill dam with a gross capacity in the order of ±330 000m³ including an open channel spillway and piped outlet works. The embankment will have a maximum height of ±14m, a total length in the order of ±519m and a crest width of ±4m. The bulk of the embankment earth fill would come from inside the dam basin below the full supply level. The construction site will include the total footprint of the dam, borrow areas and related works as well as 10m wide workspace surrounding the site. In addition to this a suitable area would be made available, if required by the contractor, where operators will be allowed to park and stay in caravans on the premises.

For additional information refer to detailed method statements drafted by Sarel Bester Ingenieurs Bpk (2017).

The final design of both structures will be done in accordance with the specifications enclosed in the Water Use Licence conditions. Strict provision will also be made for instream flow releases in line with the DWS reserve determinations (personal communication Mrs. L. B from Sarel Bester Ingenieurs BK).

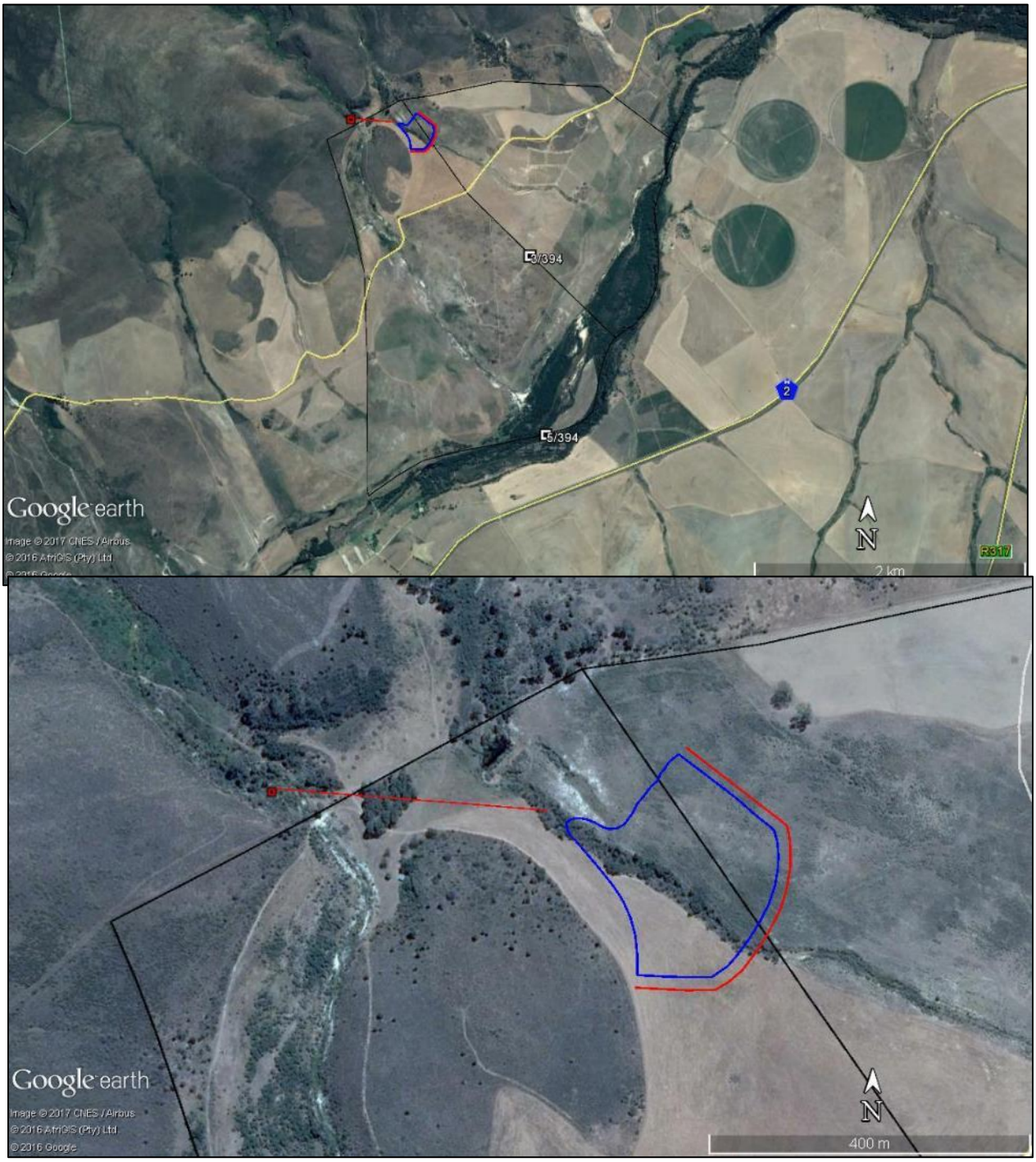

Figure 1: Location of the proposed dam and pipeline as well as the weir proposed for reconstruction in relation to surrounding areas (Google Earth Pro, 2016)..

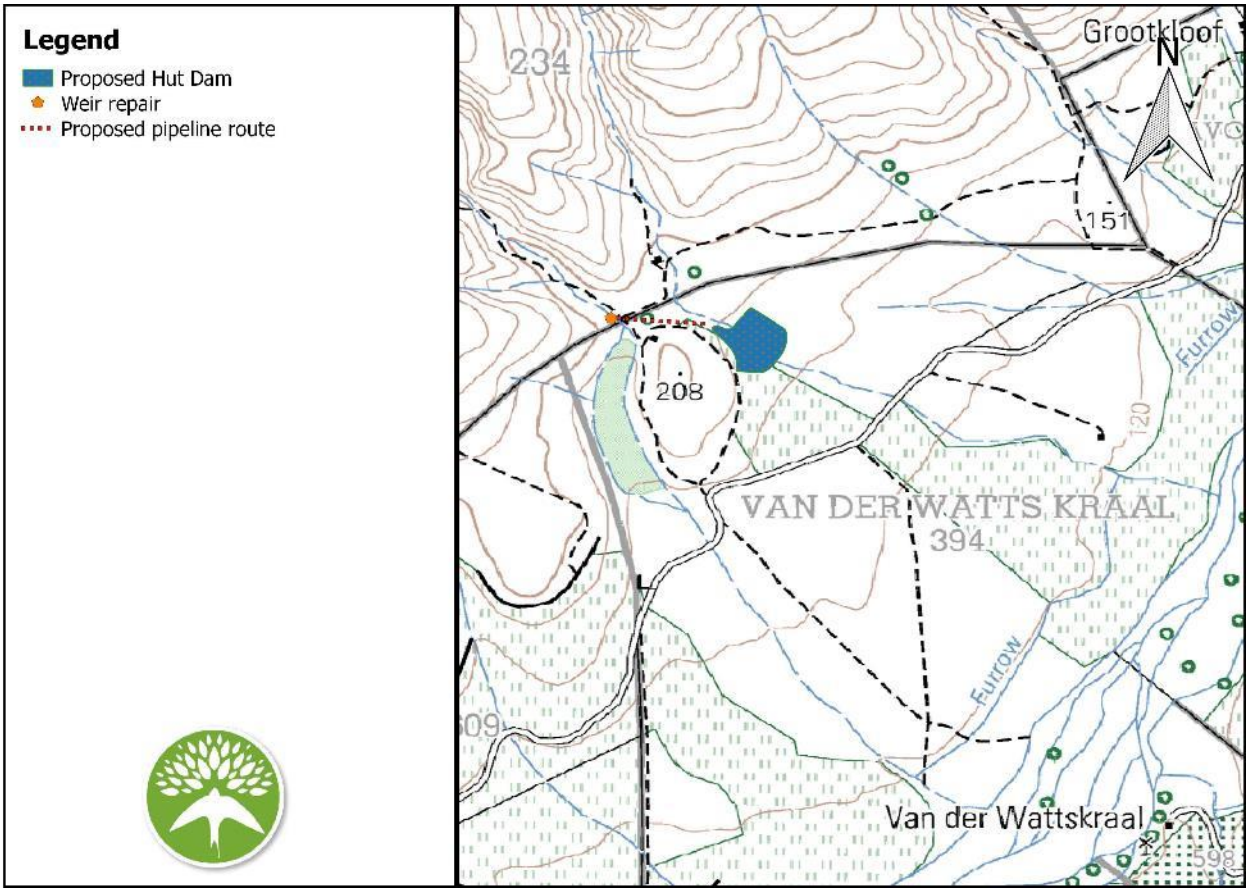

Figure 2: Topo-Cadastral imagery (2005) indicating the locality of the proposed activities in relation to the general surroundings.

Brief Synopsis Freshwater Assessment undertaken by EnviroSwift (Pty) Ltd dated May 2017.

Summary of background Information:

The watercourse in which the repair of the weir is required has been indicated as a floodplain wetland within a moderately modified condition, according to the National Freshwater Ecosystems (NFEPA) database (2011). The watercourse in which the dam is proposed has not been identified as wetland habitat. The perennial Riviersonderend River is located approximately 1km to the south east of the proposed dam, however the catchment in which the proposed dam and weir fall has not been selected as a River Freshwater Ecosystem Priority Area (FEPA), which would have increased conservational importance of the catchment significantly.

The proposed dam will intersect an Ecological Support Area 2 (ESA 2) (WCBSP, 2017). Category 2 ESAs are areas that are likely severely degraded or have no natural cover remaining and therefore require restoration. These areas are not essential for meeting biodiversity targets but play an important role in supporting the functioning of Critical Biodiversity Areas (CBAs) or protected areas, and are often vital for delivering ecosystem services. The management objectives for Category 2 ESAs is to restore or manage the features to minimize impacts on ecological processes and ecological infrastructure functioning, especially soil and water related services, and to allow for faunal movement.

Summary of freshwater assessment results:

The weir and Hut Dam are proposed in separate watercourses (referred to as watercourse 1 and watercourse 2, respectively) (Figure 3). An extensive wetland seep is located to the east of the area earmarked for the dam and will be partially flooded (Figure 3). No additional aquatic features were identified along the route proposed for the pipeline. Watercourse 1 and watercourse 2 are minor tributaries of the Riviersonderend River, which located approximately 1km to the south east of the proposed dam.

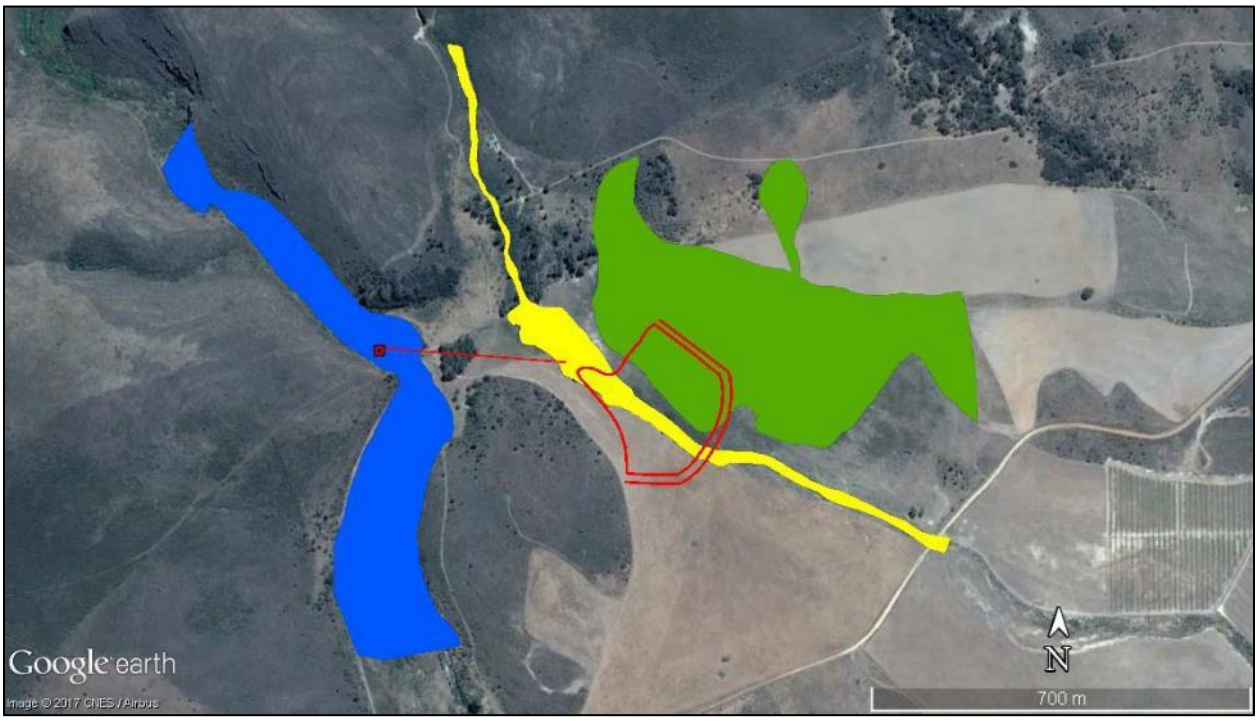

Figure 3: Delineated freshwater habitat in relation to the weir, pipeline and Hut dam (depicted with red). Watercourse 1 is presented in blue, watercourse 2 is presented in yellow and the wetland seep is presented in green.

A field survey was undertaken on the 13th of May 2017 during which several wetland indicators as defined by the then Department of Water Affairs and Forestry (DWAF, 2008) were encountered at watercourse 1 and 2. Therefore, both were classified with the use of the Classification System for Wetlands and other Aquatic Ecosystems in South Africa (Ollis *et al*. 2013) as channelled valley bottom wetlands[1] rather than rivers with riparian habitat.

The structure and function of all three features decreased substantially from their predicted natural reference condition due to decades of agricultural related activities. Consequently, watercourse 1 was determined to be within a Category C (Moderately modified) Present Ecological State (PES) and watercourse 2 as well as the wetland seep were determined to be within a Category D (Largely modified) PES.

The South African Scoring System (SASS5) macroinvertebrate-based assessment method (see Dickens & Graham 2002) is specifically designed for the assessment of the ecological integrity of perennial river systems. Watercourse 2 is non-perennial and therefore the method could only be applied to watercourse 1[2]. Out of the 22 families recorded at watercourse 1, 5 of the taxa have high SASS sensitivity ratings (≥10), indicating that the stream has fairly good water quality. The site falls within Southern Coastal ecoregion and

[1] A Valley-bottom wetland with a river channel running through it.

[2] The SASS5 assessment and interpretation of results were undertaken by Mr. T. Ngobela from the Freshwater Consulting Group.

using the applicable Biological Band/Ecological Category (Dallas, 2007) it was concluded that the site falls within Category C, indicating a moderately modified condition.

Taking all the results of the various assessments into consideration as well as observations during the field survey the Ecological Importance and Sensitivity (EIS) was determined. Watercourse 1 was determined to be of a High EIS (Wetlands that are considered to be ecologically important and sensitive. The biodiversity of these systems may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers). Watercourse 2 and the wetland seep were determined to be of a Moderate EIS (Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers).

Risk Assessment

The approach is briefly summarised below with reference to the completed Risk Assessment Matrix. In addition, refer to the dam and weir construction and method statements for the project (Sarel Bester Engineers (2017). A detailed assessment of impacts was also undertaken as part of the Freshwater Assessment undertaken by EnviroSwift (Pty) Ltd dated May 2017.

Summary of the reasoning behind the most noteworthy ratings:

- Activities will take place within wetland habitat during the construction of the dam and weir, and flooding above the dam and weir will result in impact on wetland habitat during the operational phase. A severity score of 5 was therefore designated for the impact on the flow regime, water quality, habitat, and biota for risks for which no mitigation measures can be implemented to decrease severity.
- It is the opinion of the specialist that it will be possible to decrease the significance of the remainder of the risks assessed with the implementation of measures listed within the method statements for the dam and weir (Sarel Bester Engineers, 2017) and with the implementation of mitigation measures as listed within the freshwater specialist report (EnviroSwift, 2017).
- The impact the impoundment of water could have on river systems downstream was also considered. However, should regular instream flow releases be catered for and should the Ecological Reserve be released it is the opinion of the specialist that the impact to downstream rivers will be less significant.
- Impacts associated with the loss of temporary and seasonal wetland habitat as part of the initial construction phase as well as flooding during the operational phase would remain for an extended duration of time and were scored accordingly.
- It is expected that all the majority of the onsite impacts, with exception of the loss of aquatic macroinvertebrate communities, would be detected immediately.
- All of the activities that will be required as part of the construction of the dam will be located within the wetland habitat itself and would therefore be legally governed.

A MODERATE risk class was obtained for the loss of seasonal and temporary wetland habitat and for the loss of aquatic macroinvertebrate habitat and communities during the construction phase. A MODERATE risk class was also obtained for the alteration of the hydrological regime and vegetation characteristics of wetland areas upstream and downstream of dam wall and weir, and for the loss of aquatic macroinvertebrate habitat and communities during the operational phase. The remainder of the risks assessed calculated scores falling within a LOW risk class. Please refer to the Risk Assessment Matrix appended.

Please do not hesitate to contact me should there be any aspect of the Risk Assessment you would like to discuss.

Regards
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