

# **CONFINEMENT OF MONTANASPRUIT**

## **REVIEW** **REHABILITATION PLAN**

**Review of the Existing Rehabilitation Plan for the Proposed Confinement  
of the 1:100 Year Floodplain of the Montanaspruit on Portions 28 to 42,  
137 & 138 of Doornpoort 295 JR, City of Tshwane, Gauteng Province**

**Compiled by**

**Flori Scientific Services**



**JULY 2019**

## **1 REPORT INFORMATION**

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**PROJECT TITLE:** Confinement of Montanaspruit

**STUDY NAME:** Review of Rehabilitation Plan

**COMPILED BY:** Flori Scientific Services cc

**AUTHOR/S:** Johannes Oren Maree, MSc.; MBA; *Pr. Sci. Nat.*

**DATE OF REPORT:** 19 July 2019

**REPORT STATUS:** Final Draft

**REPORT NUMBER:** MS/RP\_01

## **2 EXECUTIVE SUMMARY**

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### **Background**

The City of Tshwane Municipality has over the years received numerous complaints regarding the flooding of the Montanaspruit (Montana Stream) in the Pretoria area since the mid 1990s. The proposed project of remedial action involves the confinement the 1:100 year floodline, widening and flattening of the floodplain and canalisation of the mainstream channel, where necessary. The proposed project activities and actions cover an approximate area of 22.45 hectares on portions 28 to 42, 137 and 138 of Doornpoort 295-JR, City of Tshwane, Gauteng Province.

Flori Scientific Services cc was appointed as the independent consultancy to conduct the review of the rehabilitation plan.

Additional field investigations were conducted on 28 March 2019.

### **Location of the study area**

The study site is a section of the Montanaspruit, which is situated on Portions 28 to 42, 137 and 138 of Doornpoort 295-JR, City of Tshwane, Gauteng Province. The site is north of Sefako Makgatho Drive (Zambezi Drive, R513); west of the N1, and south of the N4 (Rustenburg highway).

### **Reports reviewed**

The following report relating to the project was reviewed:

- Rehabilitation and Floodplain Restoration Plan for Montanaspruit Upgrade. April 2011. Strategic Environmental Focus (Pty) Ltd.

### **Summary of review**

The following is a summary of the review of the report:

- The ecological and aquatic specialist studies and reports are important background documents to the rehabilitation plan. The findings and recommendations of these studies must also be implemented along with the rehabilitation plan as integral parts of the project.
- It is essential that construction activities within the main stream channel, riparian zone and floodplains only take place in the dry, winter months.
- The rehabilitation plan is excellent, detailed and site-specific. It should be implemented as is, with limited to no alterations. The plan along with selected floral species for rehabilitation is still very relevant. The list of invasive weeds

species that need to be controlled and eradicated (as referenced in the ecological studies) is also still relevant and must be implemented.

- The rehabilitation plan mentions the possibility of re-seeding with grass species. This should not be seen as just an alternative option, but must be implemented as part of the full rehabilitation plan.
- All grass species recommended for rehabilitation (re-seeding) are locally indigenous and should be used, with the exception of *Eragrostis tef* (Tef). Although Tef is commonly used for rehabilitation it is not a locally indigenous grass species and should therefore not be used.
- Artificial fertilisers should not be used as part of the re-seeding process. This is not mentioned in the rehabilitation plan.
- The rehabilitation discusses the possible rerouting of the main channel of the stream. This is not ideal and if possible should not be done. However, it is appreciated that due to engineering and construction plans this may be unavoidable.
- It is recommended that for every one indigenous tree that is removed, two be replanted in the same or nearby, similar habitat.
- The rehabilitation plan gives a list of some locally indigenous trees and their preferred habitat. This must be carefully followed as certain trees are habitat specific and will (for example) not survive in wet areas, or prefer sandy soils to clay soils.
- The actual layout plan of the rehabilitation plan is very good and still very relevant. The plan must be followed and any necessary changes must first be discussed and agreed upon with the ECO / Ecologist.
- An independent ECO / Ecologist is critical to the success of the rehabilitation of the project area.
- The rehabilitation process must be viewed as part of the construction phase. Some of the rehabilitation can already start before the project is completed. Furthermore, if all rehabilitation is only left until after the construction phase contractors often leave the site and either don't return or fail to complete and successfully implement the full rehabilitation plan.

### **3 REVIEW & APPROVAL**

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<b>Name</b>	<b>Title &amp; Company</b>	<b>Signature</b>	<b>Date</b>
Johannes Maree	Ecologist & Author (Flori Scientific Services)		20/07/2019
Delia De Lange	Lead EAP (TGM Environmental Services)		

### **4 ACKNOWLEDGEMENTS**

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The author/s would like to acknowledge and thank TGM Environmental Services and other roleplayers for their assistance with project information and queries related to the project.

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## 5 ACRONYMS

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CBA	Critical Biodiversity Areas
CMA	Catchment Management Agencies
DEA	Department of Environment Affairs
DWS	Department Water and Sanitation
EAP	Environmental Authorised Practitioner
EIS	Ecological Importance & Sensitivity
EMC	Environmental Management Class
HGM	Hydrogeomorphic
NFEPA	National Freshwater Ecosystem Priority Areas
NPAES	National Protected Areas Expansion Strategy
PES	Present Ecological State
PDA	Primary Drainage Area
QDA	Quaternary Drainage Area
REC	Recommended Ecological Category (or Class)
REMC	Recommended Ecological Management Category (or Class)
RHP	River Health Programme
RVI	Riparian Vegetation Index
SANBI	South African National Biodiversity Institute
SWSA	Strategic Water areas of South Africa
WMA	Water Management Areas
WUL	Water Use Licence
WULA	Water Use Licence Application

## **6 BACKGROUND**

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### **6.1 Project overview**

The City of Tshwane Municipality has over the years received numerous complaints regarding the flooding of the Montanaspruit (Montana Stream) in the Pretoria area since the mid 1990s. The proposed project of remedial action involves the confinement the 1:100 year floodline, widening and flattening of the floodplain and canalisation of the mainstream channel, where necessary. The proposed project activities and actions cover an approximate area of 22.45 hectares on portions 28 to 42, 137 and 138 of Doornpoort 295-JR, City of Tshwane, Gauteng Province.

A number of specialist studies were conducted for the proposed project, including a rehabilitation plan. The studies and plans were conducted a few years ago and need to be reviewed and updated if and where necessary. Flori Scientific Services cc was appointed as the independent consultancy to conduct the review of the rehabilitation plan.

Additional field investigations were conducted on 28 March 2019.

### **6.2 Reports reviewed**

The following report relating to the project was reviewed:

- Rehabilitation and Floodplain Restoration Plan for Montanaspruit Upgrade. April 2011. Strategic Environmental Focus (Pty) Ltd.

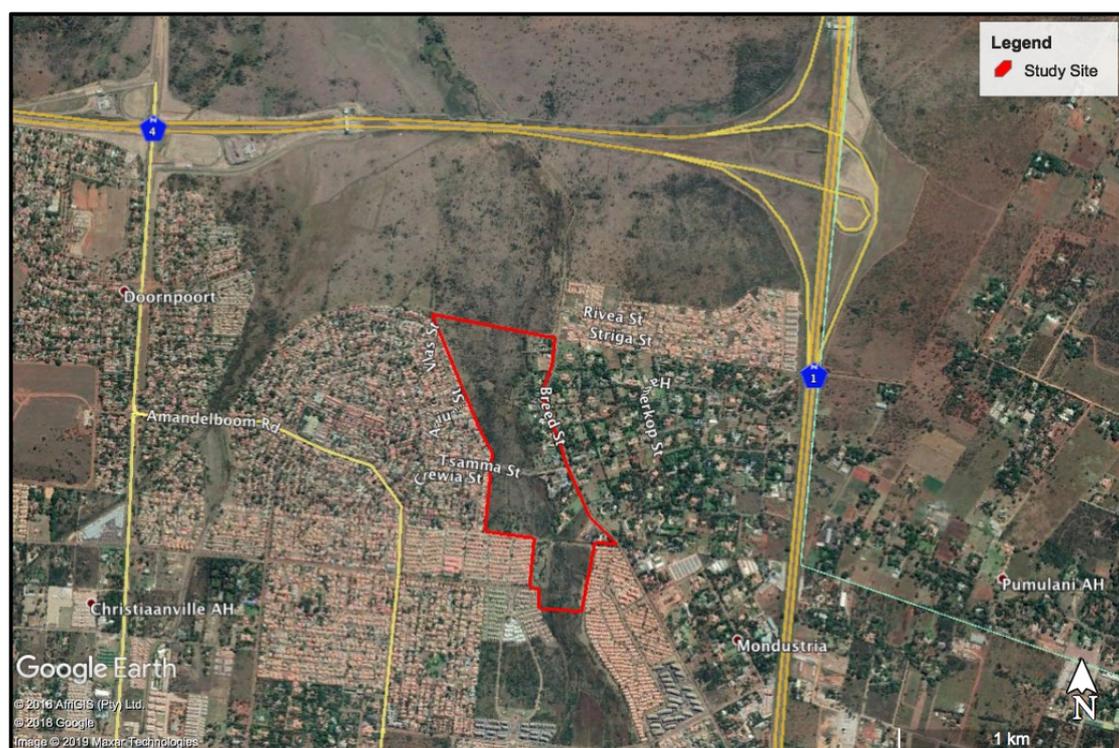
### **6.3 Study Site Location**

The study site is a section of the Montanaspruit, which is situated on Portions 28 to 42, 137 and 138 of Doornpoort 295-JR, City of Tshwane, Gauteng Province. The site is north of Sefako Makgatho Drive (Zambezi Drive, R513); west of the N1 Highway, and south of the N4 (Rustenburg Highway) (Figure 1).

### **6.4 GPS Coordinates of the Main Landmarks**

The GPS coordinates of the main landmarks within the project area are as follows:

- North end of site (Montanaspruit): 25°38'37.07"S; 28°15'35.13"E.
- South end of site area (Montanaspruit): 25°40'50.19"S; 28°15'42.34"E.
- Erasmia: 25°48'23.80"S; 28°05'31.69"E.
- 1:50 000 Topo Map reference (QDS): 2528CB (Silverton).
- Quaternary Drainage Area (QDA): A21B.



**Figure 1: Study Site**

### **6.5 Purpose of the study**

The study is a review and update of the existing rehabilitation plan. The initial rehabilitation assessment and plan were concluded a few years ago and is therefore necessary to review and update. The project involves the proposed confinement of the Montanaspruit in the area of Montana Park, Mondustria and Doornpoort. Project activities trigger numerous environmental requirements, including the need for certain specialist studies and plans.

### **6.6 Quality and age of base data**

The latest data sets and project-specific specialist studies were used for the report in terms of background information. Data used was sourced from the same data sets that are nationally used and approved by all consultants and governmental departments and organisations.

The source and age of data used included the following:

- Threatened ecosystems: Latest datasets were obtained from the SANBI website ([www.bgis.sanbi.org](http://www.bgis.sanbi.org)).
- Veld types and ecosystems: Mucina & Rutherford, 2006, 2010. Updated in 2012 (National vegetation maps 2012 beta 2).
- SANBI data sets – latest updated website data ([www.bgis.sanbi.org](http://www.bgis.sanbi.org)).

- National environmental screening tool (Dept. Environmental Affairs) - ([www.environment.gov.za](http://www.environment.gov.za)).
- Gauteng Conservation Plan (C-Plan) version 3.3.

### **6.7 Update of environmental plans and frameworks**

During the last few years important environmental conservation plans and frameworks have been updated as shown below. The rehabilitation plan was compiled in 2011 and the plans and frameworks listed below do not have any direct reference or impact on the findings, conclusions and recommendations of the plan.

- The latest conservation plan (v3.3) for the Gauteng Province came out in 2011. The CBAs and ESAs have been updated according to this C-Plan v3.3.
- The latest GPEMF was adopted in 2018 (Gazette 41473: Notice 164 of 2 March 2018). Publication of the GPEMF Standard for Implementation. Adoption of the GPEMF Standard and exclusion of associated activities from the requirement to obtain environmental authorisation in terms of section 24(2)(d) and 24(10)(a), read with section 24(10)(d), of the National Environmental Management Act, 1998.

### **6.8 Assumptions and limitations**

The assumptions and limitations for the assessment are as follows:

- All information regarding the proposed project and related activities as provided by the Client are taken to be accurate;
- Additional field investigations were conducted on 28 March 2019.
- Precise buffer zones, regulated zones, etc. or exact GPS positions cannot be made using generalised corridors or kml files on Google Earth. However, the buffer zones drawn are accurate to within 2-3m;
- Standard and acceptable methodologies as required and used in South Africa were used.
- The latest data sets were used in terms of obtaining and establishing background information and desktop reviews for the project. The data sets were taken to be accurate, but were verified and refined during field investigations.

## **7 METHODOLOGY**

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### **7.1 Desktop assessment**

A literature review was conducted regarding the existing specialist study, plan and report and compared to the latest existing base data such as shown above in Section 6, as some of these have changed and been updated during the last few years. Various online environmental screening tools were also used to assess the latest data available, such as the DEA national environmental screening tool. Part of the desktop assessment and review of the existing report was also to determine if there were any information gaps that needed to be addressed.

### **7.2 Field surveys**

A site investigation was conducted for the purpose of ground-truthing and to determine to what extent the study area has changed during the last few years. During the field surveys, cognisance was taken of the following environmental features and attributes:

- Biophysical environment, including terrestrial and aquatic ecosystems;
- Regional and site specific vegetation;
- Habitats ideal for potential red data fauna and flora species;
- Sensitive faunal and floral habitats; and
- Red data and orange data fauna and flora species.

Digital photographs and GPS reference points of importance were recorded and used throughout the report when and where necessary.

## **8 REVIEW OF REPORTS**

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### **8.1 Assessment of the study site**

Over the past 11 to 12 years (2007 – 2019) the areas to the south (in particular) and to the east of the study site have increased in terms of urbanisation, while areas in the north have not altered much as can be seen in satellite images taken over the years. The Montanaspruit (Montana Stream) is the only watercourse that flows through the study area, from south to north (Figure 2). The rehabilitation focuses in particular on the study area where upgrade and construction activities on the Montanaspruit will be centered. The fundamental reason for the proposed project of confining the Montanaspruit (and thereby also reducing the floodlines and floodplains of the stream) is to alleviate the flooding of nearby properties and streets. Many of the proposed upgrade and confinement activities will take place directly within the watercourse, riparian area and floodplains. These activities will lead to disturbances and alterations of the characteristic of the watercourse. It was therefore imperative that a rehabilitation plan is compiled and that findings and recommendations are implemented as part of the project.

It must be appreciated that the project is within a watercourse, which are always considered as sensitive. The open thornveld is also part of the Marikana Thornveld veld type, which is a threatened ecosystem with a status of vulnerable (VU). Most of the study site is also within demarcated critical biodiversity areas (CBAs) and ecological support areas (ESAs). All of these attributes add to the sensitivity and importance of the natural environment in which the project is taking place and increases the importance for proper and detailed rehabilitation.



Figure 2: Study site and Montanaspruit



Figure 3: 50-year and 100-year floodlines of the Montanaspruit in the study site

## 8.2 Summary of review

The following is a summary of the review of the report:

- The ecological and aquatic specialist studies and reports are important background documents to the rehabilitation plan. The findings and recommendations of these studies must also be implemented along with the rehabilitation plan as integral parts of the project.
- The rehabilitation plan recommends that restructuring activities take place during the dry, winter season. This is essential for any activities in the mainstream channel, riparian area and floodplains. During the summer rainy season water flow is at its highest, wild plants are flowering and the breeding of wild aquatic fauna, etc. are at their optimum and should then not be disturbed.
- The rehabilitation plan is excellent, detailed and site-specific. It should be implemented as is, with limited to no alterations. The plan along with selected floral species for rehabilitation is still very relevant. The list of invasive weed species that need to be controlled and eradicated (as referenced in the ecological studies) is also still relevant and must be implemented.
- The rehabilitation plan mentions the possibility of re-seeding with grass species. This should not be seen as just an alternative option, but must be implemented as part of the full rehabilitation plan.
- All grass species recommended for rehabilitation (re-seeding) are locally indigenous and should be used, with the exception of *Eragrostis tef* (Tef). Although Tef is commonly used for rehabilitation it is not a locally indigenous grass species and should therefore not be used.
- Artificial fertilisers should not be used as part of the re-seeding process. This is not mentioned in the rehabilitation plan. The recommended grasses re-seed and establish easily and don't require additional feeding. Furthermore, artificial fertilisers will increase levels of nitrates, phosphates and other elements in the water ecosystem, which is undesirable.
- The rehabilitation discusses the possible re-routing of the main channel of the stream. This is not ideal and if possible should not be done. However, it is appreciated that due to engineering and construction plans this may be unavoidable. In this case, this main only take place in the dry winter months. Furthermore, on completion of construction activities in the stream, the main channel must be realigned to its original. This is discussed and laid out in the rehabilitation plan.

- It is recommended that for every one indigenous tree that is removed, two be replanted in the same or nearby, similar habitat. The trees replaced do not have to be of the same age or size of the ones removed. Young saplings may be used, but should be at least two years of age, which increases the chances of successful establishment.
- The rehabilitation plan gives a list of some locally indigenous trees and their preferred habitat. This must be carefully followed as certain trees are habitat specific and will (for example) not survive in wet areas, or prefer sandy soils to clay soils.
- The actual layout plan of the rehabilitation plan is very good and still very relevant. The plan must be followed and any necessary changes must first be discussed and agreed upon with the ECO / Ecologist.
- An independent ECO / Ecologist is critical to the success of the rehabilitation of the project area.
- The rehabilitation process must be viewed as part of the construction phase. Some of the rehabilitation can already start before the project is completed. Furthermore, if all rehabilitation is only left until after the construction phase contractors often leave the site and either don't return or fail to complete and successfully implement the full rehabilitation plan.

## 9 APPENDICES

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### 9.1 Photographs



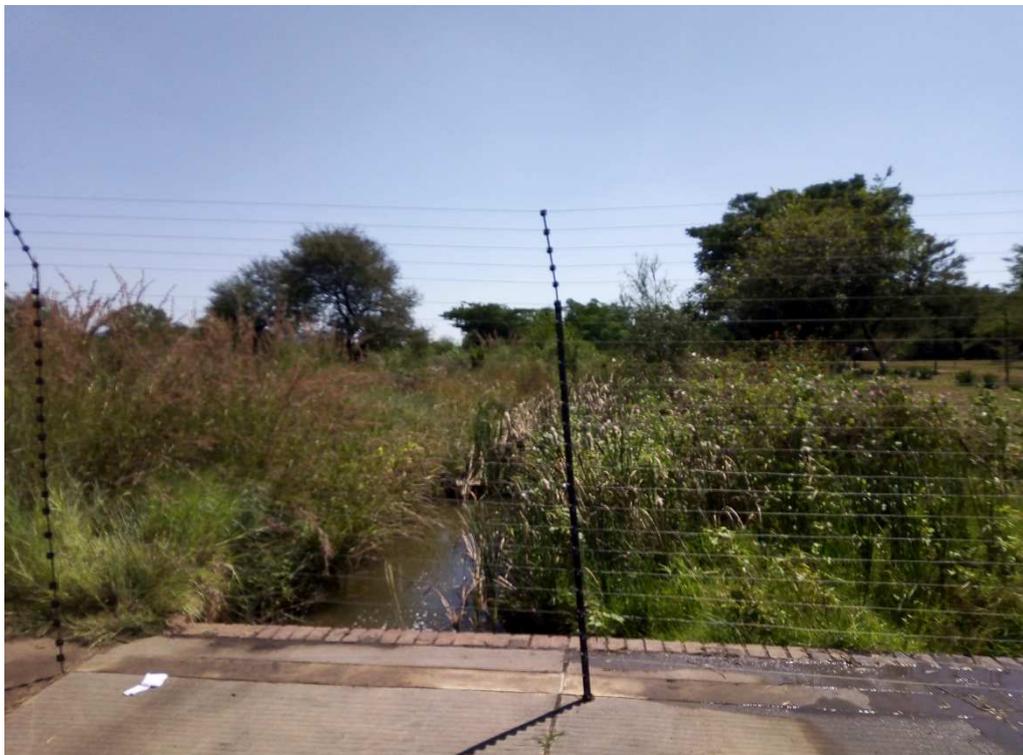
**Photo 1: Montanaspruit (Stream)**



**Photo 2: Built up suburbs and gardens along Montanaspruit**



**Photo 3: Stream showing dense grasses and rushes along the banks and in the riparian zone**



**Photo 4: Low-level bridge and road crossing over Montanaspruit (Tsamma St)**

## 10 REFERENCES

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## 11 DECLARATION

### DECLARATION OF INDEPENDENCE

I, **Johannes Oren Maree**, do hereby declare that I :

- Act as an independent ecologist, wetland specialist and environmental specialist in compiling this report;
- Do not have any financial interests, or stand to gain in any way whatsoever in the undertaking of this activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- Do not have, nor will have, any vested interest in the proposed activity proceeding;
- Have no, neither will engage in, conflicting interests in the undertaking of this activity;
- Undertake to disclose, to the competent authority, any material information that has, or may have, the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2014; and
- Will provide the competent authority with access to all information at my disposal regarding the investigations, studies and application, whether such information is favourable to the applicant or not.

*The South African Council for Natural Scientific Profession (SACNASP) certifies that in terms of Section 20(3)(a) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003), that Mr. J.O. Maree is registered as a Professional Natural Scientist.*

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SIGNATURE:  \_\_\_\_\_

NAME OF COMPANY: **Flori Scientific Services cc**

DATE: \_\_15 July 2019 \_\_