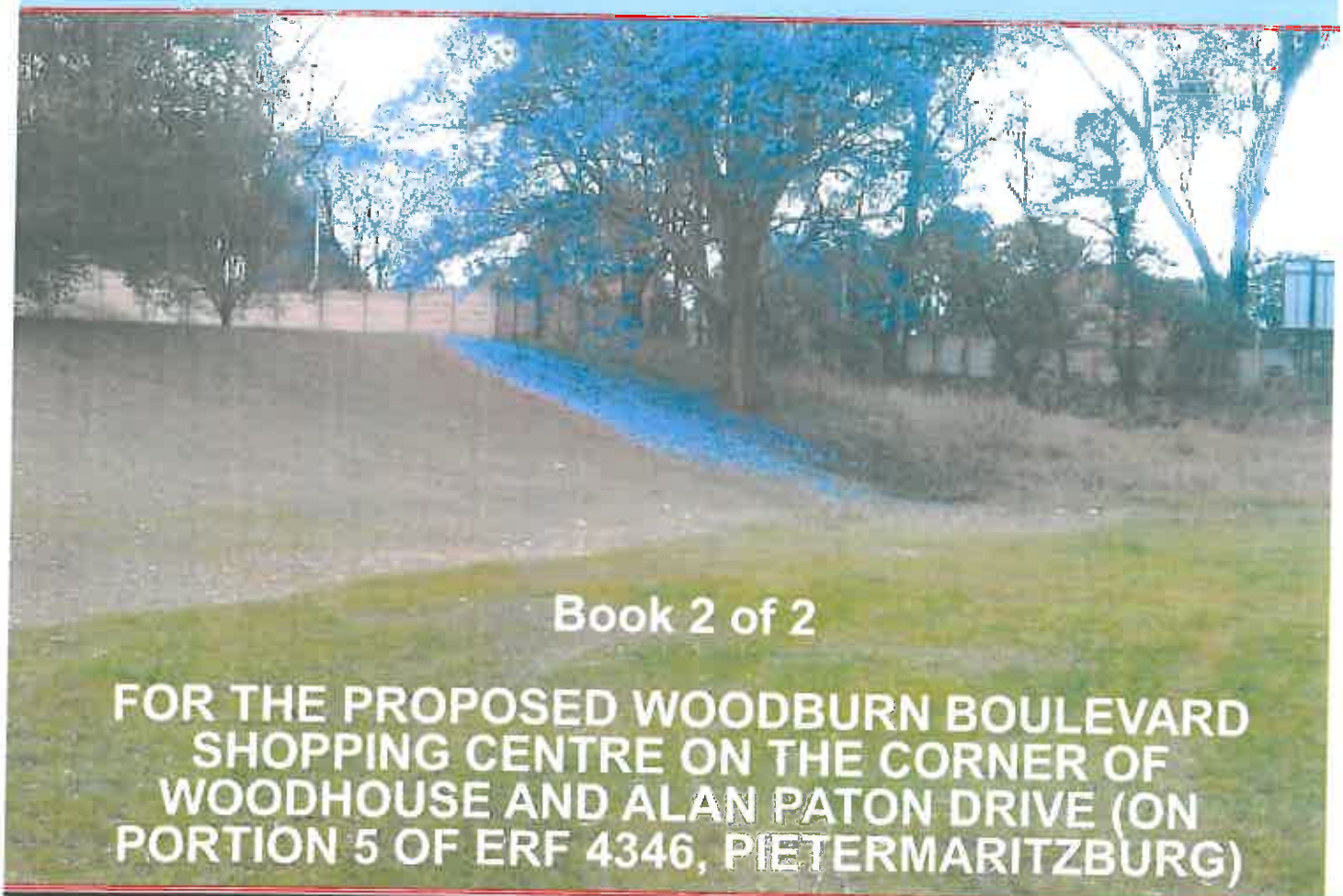
ADDENDUM TO BASIC ASSESSMENT AS REQUESTED BY KZN DEPARTMENT OF AGRICULTURE & ENVIRONMENTAL AFFAIRS



Book 2 of 2

FOR THE PROPOSED WOODBURN BOULEVARD SHOPPING CENTRE ON THE CORNER OF WOODHOUSE AND ALAN PATON DRIVE (ON PORTION 5 OF ERF 4346, PIETERMARITZBURG)

DECEMBER 2013- DC22/0059/2011

Bokamoso ENVIRONMENTAL

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Bokamoso ENVIRONMENTAL

WB/2013/KZNDEA/2

22 November 2013

KZN Department of Agriculture & Environmental Affairs
Private Bag x07
Cascades
Pietermaritzburg
3202

Attention: Mr. Kraigen Govindasamy

RE: DC22/0059/2011: REJECTION OF THE BASIC ASSESSMENT REPORT FOR THE PROPOSED WOODBURN BOULEVARD SHOPPING CENTRE ON THE CORNER OF WOODHOUSE AND ALAN PATON DRIVE ON PORTION 5 OF ERF 5346, LOCATED WITHIN PIETERMARITZBURG, MSUNDUZI MUNICIPALITY

I refer to our meeting of 10 September 2013 during which we discussed the Department's reasons for rejecting the BAR that was submitted for evaluation.

1) Introduction and Background

During the meeting of 10 September 2013 it was indicated that the Department need feedback/inputs regarding the items as listed in the rejection letter of 5 July 2013. The Department furthermore requested that the outstanding matter specifically be addressed in a separate document, which will be regarded as an addendum to the FBAR. ***(Refer to Appendix A for letter from the department)*** This correspondence letter represents the addendum document and the additional inputs required are addressed under Section 2 below. ***Also Refer to Appendix B for updated issues and response report***

2) Additional Inputs Required by KZNDAEA

KZNDAEA Requirement:

- *"In terms of the requirements of Regulation 56 (20 of the Environmental Impact Assessment Practitioner (EAP) submits a final report to the Competent Authority, the EAP must give registered Interested and Affected (I&AP's) access to and an opportunity to comment on the report in writing.*

  In this regard, Ezemvelo KZN Wildlife (EKZNW), as an organ of state, must be afforded the opportunity to comment on the Basic Assessment Report prior to it being submitted to this Department for review. It is noted that the EAP circulated a notification of the availability of the Basic Assessment Report to EKZNW in an attempt to obtain comments but utilised incorrect contact details.

  Accordingly to rectify the matter, the Basic Assessment Report (dated April 2013) must be circulated by the EAP to EKZMW for review and comment. The following contact details for EKZNW must be used by the EAP for submitting the documentation required in terms of this letter:

  Ezemvelo Elizabeth Park
  1 Peter Brown Drive
  Montrose
  Pietermaritzburg
  3202

  Fax 033 845 1499
  Tel: 033 845 1455

  Attention: Mr. D Wieners

As such the EAP must provide the Department with proof that EKZNW have been notified upon circulation of the BAR. All issues and concerns raised by EKZNW must be addressed prior to submission of the addendum to the BAR to this Department for consideration."

Bokamoso Response:

The BAR and the addendum document are now made available to EKZNW for comment. The comments received will be included as part of the final document to be submitted to KZNDAEA. The comment period is 21 days, excluding the holiday period associated with the festive season.

KZNDAEA Requirement:

- *"Comment from the Msunduzi Municipality: Infrastructure Development, Service Delivery and Maintenance Management Unit on the Traffic Impact Assessment (prepared by WSP SA Civil and Structural Engineers and dated November 2010) and confirmation on the egress/access points of the proposed development is required."*

Bokamoso Response:

The BAR and the addendum document are now made available to *the Msunduzi Municipality: Infrastructure Development, Service Delivery and Maintenance Management Unit* and it is requested that this division of the local authority urgently supply their comments (in writing) regarding the WSP Traffic Impact Assessment and that this division specifically confirm the egress/access points of the development. The comment period is 21 days, excluding the holiday period associated with the festive season.

EKZNW for comment. The comments received will be included as part of the final document to be submitted to KZNDAEA. The comment period is 21 days, excluding the holiday period associated with the festive season.

KZNDAEA Requirement:

- *"Correspondence from Bokamoso Landscape Architects and Environmental Consultants dated 15 February 2013 states that a meeting was held with the Department of Water Affairs (DWA) in terms of the proposed development and that the DWA indicated the proposed development would be supported provided that floodline management principles similar to that of the Liberty Mall were applied to the proposed development and that basement parking is incorporated in order to elevate the Shopping Centre to be above the floodline. The EAP further indicated in this correspondence that a Stormwater Management Plan and Floodline Report (prepared by Jeffares and Green Consulting Engineers and undated) was prepared to meet the requirements of the DWA*

  With respect to the above-mentioned correspondence received from Bokamoso Landscape Architects and Environmental Consultants, this Department requests that the EAP provide this Department with a copy of the minutes of the meeting held with the DWA."

Bokamoso Response:

There are no specific minutes of the meeting. A summary of the discussions with DWA was incorporated as part of the DBAR and the inputs supplied were based on the requirements of DWA. It was agreed at the meeting that Bokamoso would address the issues raised in the DBAR and that DWA would supply comments regarding the DBAR. ***Refer to Appendix C for a copy of a summary letter and for the inputs supplied in the DBAR.***

KZNDAEA Requirement:

In addition, this Department requests that the DWA be afforded the opportunity to comment on the Stormwater Management Plan and Floodline Delineation Report and that the EAP must provide this Department with proof that the DWA has been notified of the circulation of the Stormwater Management Plan and Floodline Delineation Report. All issues and concerns raised by the DWA must be addressed and included in the addendum to the BAR submitted to this Department for consideration."

Bokamoso Response:

The BAR and the addendum document are now made available to DWA and it is requested that DWA supply their comments regarding the *Stormwater Management Plan and Floodline Delineation Report*. The comment period is 21 days, excluding the holiday period associated with the festive season.

KZNDAEA Requirement:

- *"Page 71 of the BAR prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) states that a Record of Decision (RoD) was already issued in terms of the activity alternative (A2) for the proposed development. With respect to the above-mentioned correspondence received from (Brava Engineers (Pty) Ltd) and information contained in the BAR, this Department requires that the EAP provide this Department with a copy of the above-mentioned RoD."*

Bokamoso Response:

This information is incorrect and is a typing error. This section has been amended to incorporate the applicable information. Refer to Page 71 of the BAR.

KZNDAEA Requirement:

- *"In addition, reference is made to the 2001 DFA approval for this proposed development.*

  Kindly provide this Department with a full copy (including layouts etc.) of this approval for reference purpose and to ensure consistency in respect of access points and layout etc."

Bokamoso Response:

Please find attached hereto ***(as Appendix D)*** a copy of the DFA approval as supplied to us by the local authority.

KZNDAEA Requirement:

- *"On page 73 of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) the EAP recommends that the delegated authority only approve Activities 9, 11, 37 and 39 listed in terms of Government Notice No. R.544 of 18 June 2010.*

  However, page 12 of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) indicates that Activity 18 of Government Notice No. R.544 of 18 June 2010 will be triggered as more than 5m³ of material will be excavated from a watercourse during the construction phase of the proposed development. With respect to the above, this Department requests clarity on whether Activity 18 of Government Notice No.R.544 of 18 June 2010 is triggered by the proposed development."

Bokamoso Response:

We included this activity, because we wanted to cater for possible storm water discharge pipes into and along the watercourse. According to the appointed storm water engineers this activity will not be triggered. The applicability of this activity will be confirmed as soon as the storm water management plan and the DWA comments have been addressed to the satisfaction of all parties. If this activity is not triggered, it will be omitted from the list of activities applied for. The application form will also be amended to omit this activity.

KZNDAEA Requirement:

- "It is also noted on page 74 of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) that it is requested to exclude Activity 24 of Government Notice No.R544 of 18 June 2010 from the authorisation as the study area is noted zoned open space. Clarity is required on this aspect as this activity does not appear in the application form or BAR listed activities."

Bokamoso Response:

At the beginning of the application process, Bokamoso was not certain about the zoning of the property, which was formerly used as a rugby club. It was therefore decided to rather include that activity (Activity 24 of Listing Notice 1 – R.544, 18 June 2010 of NEMA) as part of the application, because it would have been difficult to include the activity after the process had been completed. This activity has eventually been removed from the list of activities applied for after the local authority confirmed that the study area has been rezoned and the current zoning is not for open space/ any equivalent zoning.

Activity 24 is not triggered by the proposed development and therefore the amended application form will not include activity 24 of Listing Notice 1.

KZNDAEA Requirement:

- *"The application for Environmental Authorisation (prepared by Bokamoso Landscape Architects and Environmental Consultants and received by this Department on 28 September 2011) must be amended to specify the relevant listed activities triggered by the proposed development and that which require Environmental Authorisation."*

Bokamoso Response:

Please find the amended application form included as ***Appendix E.***
Note: The Amended application form will be submitted to KZN DAEA together with the Final BAR

KZNDAEA Requirement:

- *"The site layout plan must be revised to illustrate the 1:50 and 1:100 year floodlines of the proposed development site and submitted to this Department for approval. The Ground Floor Plan (prepared by Boogertman and Partners and dated April 2000) included as Appendix A of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) must be used as a baseline for the site layout plan template and revised with reference to the layout plan included as Appendix B of the Stormwater Management Plan and Floodline Delineation Report (prepared by Jeffares and Green consulting engineers and undated)."*

Bokamoso Response:

Refer to Appendix F

KZNDAEA Requirement:

- *"A description of all identified alternatives[1] that are feasible and reasonable, including the advantages and disadvantages that the proposed activity will have on the environment and on the community that may be affected by the alternative activity in accordance to Regulation 28(1)(c)of the EIA Regulations, 2010. The alternatives must also include:*

  i) Alternative sites for the proposed development;

  ii) Alternatives in terms of layouts;

  iii) Alternatives in terms of alternate uses for the site; and,

  iv) Alternatives in terms of sewage disposal methods.

  The alternatives must also provide a description of the environment that may be affected by the proposed development, either on site and the surrounding environment."

Bokamoso Response:

Refer to Appendix G (also included as chapter 7 of the BAR)

Alternative sites for the proposed development:

There are no alternative sites. The proposed site is ideally situated for a shopping centre development and the proposed development has already been approved by the Natal DFA Tribunal and it is also fully supported by the involved local authority. In fact, the study area has already been rezoned to accommodate the proposed development.

Alternatives in terms of layouts:

The project team considered various layout alternatives before they finalised the layout. The layout has been fixed in during the DFA hearing. The study area is not regarded as ecologically sensitive and therefore it was not necessary to amend the layout to accommodate environmental sensitivities.

The current layout for the shopping centre takes cognisance of the access points and the parking areas are situated in the lower section of the study area for flood management and storm water management purposes.

Alternatives in terms of alternate uses for the site:

As already mentioned the proposed development has already been approved by the involved authorities and the site has been rezoned. The site is strategically located and is regarded as an ideal site for a shopping centre.

Alternatives in terms of sewage disposal methods:

The site will be connected to the municipal sewer system. A connection point is available at the site and the local authority already confirmed that there is capacity available at the municipal sewage works to accommodate the proposed development.

KZNDAEA Requirement:

- *"In accordance with Regulation 24(2) of the EIA Regulations, 2010, this Department requests that the BAR and the application for Environmental Authorisation must be amended to include the above requirements.*

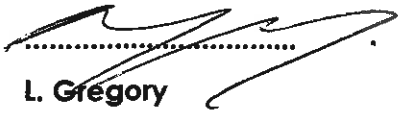
  Copies of the addendum to the BAR must be circulated to all registered Interested and Affected Parties (I&AP's) for a minimum duration of 21 (twenty-one) days. The issues raised by I&AP's must be addressed in a table format indicating the issue/concern raised and the EAP's response thereto and must include copies of the I&AP's correspondence.

  The EAP must provide proof that all registered Interested and Affected Parties have been notified of the availability of the amended BAR."

Bokamoso Response:

Bokamoso undertakes to comply with this requirement once the review period has been completed.

Regards;



L. Gregory

BLArch (UP)

Member: Bokamoso Landscape Architects and Environmental Consultants CC

Registered Professional Member at SACLAP

APPENDIX A

agriculture
& environmental affairs
Department
Agriculture
& Environmental Affairs
PROVINCE OF KWAZULU-NATAL

KZN Department of Agriculture & Environmental Affairs
Private Bag X07, Cascades, Pietermaritzburg, 3202
Tel: 033 347 1820 | Fax: 033 347 1826
Enquiries: Kraigen Govindasamy
Reference Number: DC22/0059/2011
Date: 05 July 2013
Website: www.kzndae.gov.za

Directorate: Environmental Services: uMgungundlovu District

Bokamoso Landscape Architects and Environmental Consultants
P. O. Box 11375
Maroelana
0161

ATTENTION: Lizelle Gregory **Email: lizelleg@mweb.co.za**
Telephone: (012) 346 3810

cc: Mr. Tony Stathakis **Email: ventureprop@icon.co.za**
O & T Development (Pty) Ltd

Dear Madam/Sir

RE: DC22/0059/2011: REJECTION OF THE BASIC ASSESSMENT REPORT FOR THE PROPOSED WOODBURN BOULEVARD SHOPPING CENTRE ON THE CORNER OF WOODHOUSE AND ALAN PATON DRIVE ON PORTION 5 OF ERF 5346, LOCATED WITHIN PIETERMARITZBURG, MSUNDUZI MUNICIPALITY.

1. The Basic Assessment Report (BAR) (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) for the abovementioned activity, submitted in terms of the requirements of Regulation 23 (1) of the Environmental Impact Assessment (EIA) Regulations, 2010 refers.

2. Following a review of the BAR and a site visit conducted on 30 May 2013, the Department of Agriculture and Environmental Affairs (herein referred to as "this Department") advises that it is unable to accept the BAR in accordance with Regulation 24 (1) (b) of the EIA Regulations, 2010. The BAR is rejected for the following reasons:

   2.1. In terms of the requirements of Regulation 56 (2) of the Environmental Impact Assessment (EIA) 2010 Regulations, before an Environmental Assessment Practitioner (EAP) submits a final report to the Competent Authority, the EAP must give registered Interested and Affected Parties (I&AP's) access to and an opportunity to comment on the report in writing.

   In this regard, Ezemvelo KZN Wildlife (EKZNW), as an organ of state, must be afforded the opportunity to comment on the Basic Assessment Report prior to it being submitted to this Department for review. It is noted that the EAP circulated a notification of the availability of the Basic Assessment Report to EKZNW in an attempt to obtain comments but utilised incorrect contact details.

   Accordingly to rectify the matter, the Basic Assessment Report (dated April 2013) must be circulated by the EAP to EKZNW for review and comment. The following contact details for

EKZNW must be used by the EAP for submitting the documentation required in terms of this letter:

Ezemvelo KZN Wildlife
Queen Elizabeth Park
1 Peter Brown Drive
Montrose
Pietermaritzburg
3202

Fax: (033) 845 1499
Tel: (033) 845 1455

Attention: Mr. D. Wieners

As such the EAP must provide the Department with proof that EKZNW have been notified upon circulation of the BAR. All issues and concerns raised by EKZNW must be addressed prior to submission of the addendum to the BAR to this Department for consideration.

2.2. Comment from the Msunduzi Municipality: Infrastructure Development, Service Delivery and Maintenance Management Unit on the Traffic Impact Assessment (prepared by WSP SA Civil and Structural Engineers and dated November 2010) and confirmation on the egress/access points of the proposed development is required.

2.3. Correspondence from Bokamoso Landscape Architects and Environmental Consultants dated 15 February 2013 states that a meeting was held with the Department of Water Affairs (DWA) in terms of the proposed development and that the DWA indicated the proposed development would be supported provided that floodline management principles similar to that of the Liberty Mall were applied to the proposed development and that basement parking is incorporated in order to elevate the Shopping Centre to be above the floodline. The EAP further indicated in this correspondence that a Stormwater Management Plan and Floodline Delineation Report (prepared by Jeffares and Green Consulting Engineers and undated) was prepared to meet the requirements of the DWA.

With respect to the abovementioned correspondence received from Bokamoso Landscape Architects and Environmental Consultants, this Department requests that the EAP provide this Department with a copy of the minutes of the meeting held with the DWA.

In addition, this Department requests that the DWA be afforded the opportunity to comment on the Stormwater Management Plan and Floodline Delineation Report and that the EAP must provide this Department with proof that the DWA has been notified of the circulation of the Stormwater Management Plan and Floodline Delineation Report. All issues and concerns raised by the DWA must be addressed and included in the addendum to the BAR submitted to this Department for consideration.

2.4.1 Page 71 of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) states that a Record of Decision (RoD) was already issued in terms of the activity alternative (A2) for the proposed development. With respect to the abovementioned correspondence received from (Brava Engineers (Pty) Ltd) and

information contained in the BAR, this Department requires that the EAP provide this Department with a copy of the abovementioned RoD.

2.4.2 In addition, reference is made to the 2001 DFA approval for this proposed development. Kindly provide this Department with a full copy (including layouts etc) of this approval for reference purpose and to ensure consistency in respect of access points and layout etc.

2.5.1 On page 73 of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) the EAP recommends that the delegated authority only approve Activities 9,11,37 and 39 listed in terms of Government Notice No. R.544 of 18 June 2010. However, page 12 of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) indicates that Activity 18 of Government Notice No.R.544 of 18 June 2010 will be triggered as more than $5m^3$ of material will be excavated from a watercourse during the construction phase of the proposed development. With respect to the above, this Department requests clarity on whether Activity 18 of Government Notice No.R.544 of 18 June 2010 is triggered by the proposed development.

2.5.2 It is also noted on page 74 of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) that it is requested to exclude Activity 24 of Government Notice No.R.544 of 18 June 2010 from the authorisation as the study area is noted zoned open space. Clarity is required on this aspect as this activity does not appear in the application form or BAR listed activities.

2.5.3 The application for Environmental Authorisation (prepared by Bokamoso Landscape Architects and Environmental Consultants and received by this Department on 28 September 2011) must be amended to specify the relevant listed activities triggered by the proposed development and that which require Environmental Authorisation.

2.6. The site layout plan must be revised to illustrate the 1:50 and 1:100 year floodlines of the proposed development site and submitted to this Department for approval. The Ground Floor Plan (prepared by Boogertman and Partners and dated April 2000) included as Appendix A of the BAR (prepared by Bokamoso Landscape Architects and Environmental Consultants and dated April 2013) must be used as a baseline for the site layout plan template and revised with reference to the layout plan included as Appendix B of the Stormwater Management Plan and Floodline Delineation Report (prepared by Jeffares and Green consulting engineers and undated).

2.7. A description of all identified alternatives[1] that are feasible and reasonable, including the advantages and disadvantages that the proposed activity will have on the environment and on the community that may be affected by the alternative activity in accordance to Regulation 28(1)(c) of the EIA Regulations, 2010. The alternatives must also include:

i. alternative sites for the proposed development;

ii. alternatives in terms of layouts;

iii. alternatives in terms of alternate uses for the site; and,

[1] **"alternatives"**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-
(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and,
(f) the option of not implementing the activity.

iv. alternatives in terms of sewage disposal methods.

The alternatives must also provide a description of the environment that may be affected by the proposed development, either on site and the surrounding environment.

3. In accordance with Regulation 24 (2) of the EIA Regulations, 2010, this Department requests that the BAR and the application for Environmental Authorisation must be amended to include the above requirements.

4. Copies of the addendum to the BAR must be circulated to all registered Interested and Affected Parties (I&AP's) for a minimum duration of 21 (twenty-one) days. The issues raised by I&AP's must be addressed in a table format indicating the issue/concern raised and the EAP's response thereto and must include copies of the I&AP's correspondence.

5. The EAP must provide proof that all registered Interested and Affected Parties have been notified of the availability of the amended BAR.

6. On receipt of the addendum to the BAR and the amended application form, this Department will reconsider the report in accordance with Regulation 23 (1) of the EIA Regulations, 2010.

7. Please note that the activities applied for may not commence prior to an Environmental Authorisation being granted by this Department.

Should you have any queries or wish to discuss the points raised above, please do not hesitate to contact the writer.

Yours sincerely

For: Acting Head of Department
Department of Agriculture and Environmental Affairs

APPENDIX B

APPENDIX E3: COMMENT AND RESPONSE REPORT-
2ND FINAL BASIC ASSESSMENT REPORT FOR THE PROPOSED WOODBURN BOULEVARD SHOPPING CENTRE ON CORNER OF WOODHOUSE ROAD AND ALAN PATON DRIVE (ON PORTION 5 OF ERF 4346, PIETERMARITZBURG) –
AMENDMENTS/ADDITIONS TO THE ORIGINAL ISSUES AND REPSPONSE REPORT ARE INCLUDED IN RED

Issue	Commentator	Date	Response
1. Page 12 makes reference to 'the service agreement between the local authority and the developer will be finalized as soon as the EIA authorization is issued'. Written confirmation from all relevant departments within the Msunduzi Municipality (i.e. Water and Sanitation, Electricity) is needed as part of the BAR and environmental authorization process in order to confirm that each department has the capacity to service the proposed development.	S. Farnsworth	15 August 2012	According to the appointed engineer Mr. Ryk Joubert of Brava Engineers, all the necessary services will be available for purpose of the proposed development. According to the involved local authority, they are in favor of the proposed development and the EIA Authorization is the only outstanding aspect. Note: The Draft BAR was circulated to the relevant services divisions of the local authority and Bokamoso received positive comments from the water and sanitation division. ***Refer to Appendix Eii*** It is also important to note that a special meeting was arranged in Pietermaritzburg on 5 March 2013 (with the local authority and KZN Department of Environmental Affairs)[1] to discuss the services and other matters that were unclear. During this meeting the local authority confirmed their support for the project and they also confirmed that services will be available.

[1] *The following parties attended the meeting: Mr. Mohammed Essob of KZNDEA; Ms. Shannon Farnsworth of the Local Authority (Environmental and Conservation Unit – Msunduzi Municipality) , Mr. Bartholonew of the Local Authority (Environmental and Conservation Unit – Msunduzi Municipality) and the Town Planning Division of the Local Authority and the Services divisions of the Local authority.*

2. The proposed development site is zoned 'special residential' and falls under special area 30 which lists business premises, restaurants and shops as permissible development or uses of land for that area. Therefore activity 24 under listing notice one (R. 544, 18 June 2010) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 1998) will not be triggered as the proposed site is not zoned open space.			This is correct; Bokamoso just wanted to confirm the zoning and decided to rather include that activity as part of the application process because it would have been difficult to include the activity after the process has been completed. ***Note: This activity has been removed from the final list of activities applied for in the Final BAR.***
3. Page 25 mentions that 'the National Water Act also required that (where applicable) the 1:50 and 1:100 year flood line be indicated on all the development drawings (even the development drawings for the external services) that are being submitted for approval'. However the ground floor plan (drawing no. 2502-100) does not indicate these flood lines.			A figure, which indicates the flood lines, is included as ***Appendix Di (Jeffares and Green Report) of the FBAR.***
4. Page 34 mentions "the area adjacent to the river however has high ecological potential and should be rehabilitated as part of the development project". Is the developer [O&T Development (Pty) Ltd] willing to consider this as an offset option? If so a rehabilitation program should be implemented in consultation with this unit.			The developer is willing to accept it as an offset option. In fact the developer would like for the development *(in the longer term) to open –up towards/ to enjoy access* to the watercourse. This will improve the security in the area and if rehabilitated this current constraint can be converted into an asset. The unit will be contacted for more inputs if the project is authorized by the delegated authority. During the meeting at the local authority in March 2013, it was requested that Bokamoso confirm that there is no wetland present on the study area. The appointed specialists did confirm that there is no wetland on or adjacent to the study area. ***Refer to Appendix Dii of the FBAR***

5. Page 42 makes reference to a 'plan to erect a conservation fence on the conservation line' however there is no indication of the conservation line location; this line should be indicated on all development drawings and fenced off prior to any construction taking place.			The exact position for the temporary construction conservation fence will be determined on site by the main contractor and the appointed ECO prior to the commencement of construction.
6. Page 43 mentions 'the wetland area which is situated to the south and west of the site'; wetland zones need to be clearly shown on the development plans. Furthermore on page 45 it states that 'where possible avoid any work within 1m from the wetland buffer'; the extent of the wetland buffer needs to be specified and included on all development drawings. A site visit was conducted on the 10th August 2012 and no wetland areas were identified on site, hence further clarity on the above is needed.			***Note***: It has been confirmed that there are no wetlands on or adjacent to the study area. This information has been removed from the FBAR. ***Refer to Appendix Dii for wetland survey.***
7. This unit requires a copy of the following geotechnical survey that is to be done during the rainy season in order to identify perched water conditions (page 48).			Request noted. This requirement is incorporated into the EMP. ***Refer to Appendix F.***
8. Correction on page 50, Matlosana Local Municipality must be changed to Msunduzi Local Municipality.			Correction made.
9. Page 53 makes reference to the planting of embankments with grass to stop any excessive soil erosion and scouring of the landscape. A list of indigenous grass species that will be used to be submitted to this unit for approval prior to planting taking place.			Requirement included as part of the EMP. ***Refer to Appendix F***
10. With regards to the landscaping plan, page 49 under point 12 mentions 'in cases where exotic species are to be used, such species must be non-invasive' however page 55 under point 6 says 'no plants not indigenous			Requirement noted and incorporated as part of the EMP. ***Refer to Appendix F.***

to the area should be introduced in the communal landscaping of the proposed site', this unit encourages the design of landscape plans to be fully complied of the indigenous species. The landscape site development plan (H L 0005 Site Plan) done by Habitat Landscape Architects dated 4 August 2010 seems to show the incorrect location on the cell phone tower towards the east of the site when in fact this tower is situated to the south of the site. The plan makes use of the Acacia xanthophloea in the car park, this is not recommended as these trees drop thorny branches, provide little shade and the root systems will lift paving. The landscape plan also only includes 7 plant species within a repeated design, more variety and colour should be encouraged. This unit requests that future landscape plans be done in consultation with this unit and a copy of the draft landscape plan is to be submitted to this unit for comments and approval prior to commencement.			
11. Page 59 makes reference to 'a rehabilitation plan for the construction phase'. This plan must be submitted to this unit prior to construction works commencing.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F***
12. If during construction any new evidence of archaeological site or artifacts are found, operations must be stopped and the relative competent authority, Amafa aKwazulu-Natali, must be contacted immediately as opposed to SAHRA.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F***
13. The section 21 Water Use Licenses application (page 71) must be submitted to this unit.			Note: Bokamoso already had discussions with DWA in August 2012 regarding the necessity to obtain a Section 21 WUL. According to the department, the watercourse is regarded as a man-made/ artificial watercourse, which has

			already been altered and therefore no Section 21 WUL will be required. It will only be necessary to indicate the 1:100 year flood line on the planning drawings (requirement of Section 144 of the NWA) and mitigation measures to address possible flooding problems must be applied. DWA must still supply their final comments regarding the applicability of S21WUL. The Jefarres and Green Flood Management Report has been forwarded to DWA for comment.
14. This development is required to be flood neutral and hence a storm water management plan must be undertaken and submitted to the Msunduzi Municipality for approval prior to construction commencing. Page 3 under section 3.1.3. Storm water Management, it mentions that 'it is necessary to attenuate runoff by construction a detention facility above the 1:50 year flood line'. This should be depicted on the development drawings as well as forming part of the storm water management plan.			The developer appointed Jefarres and Green Engineers to assist with the flood management of the study area. ***Refer to Appendix Di for copy Jeffares and Green report.*** A more detailed storm water management plan will be compiled and submitted to the local authority for approval prior to the construction phase.
15. Page 14 of the EMP mentions that 'fires shall not only be permitted in specifically designed areas and under controlled circumstances', what materials are intended to be burnt on site? The burning of waste material, rubbish and garden refuse on site is prohibited.			The intention was not to cater for the burning of rubbish on the site. We only included these guidelines, because the contract workers often make fires for cooking and heating purposes. We removed this guideline from the FBAR and EMP.
16. The appointed ECO must register with this unit, providing contact details and audit reports, site visits should be conducted at least every 10 working days.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***

17. The appointed ECO is to provide basic environmental awareness training to all staff working on site prior to the commencement of any construction activities.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
18. Construction staff is to make use of facilities provided for them, as opposed to alternative. Using surrounding arrears as a toilet facility is strongly prohibited.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
19. Chemical toilets should be placed outside 32cm from any watercourse i.e. the Foxhillspruit. A registers chemical waste company is to be used to remove waste from the chemical toilets on site. Documentation for this must be kept by the contractor for review purposes by the ECO if needed.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
20. Construction staff shall not the permitted to use any watercourse adjacent to the site for the purposed of bathing or washing of clothing.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
21. The contractor shall not in any way modify or damage the banks of the adjacent watercourse, unless required as part of the dissipation structures at the storm water outlet points.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
22. All concrete mixing is to take place on mixing boards to prevent contamination of groundwater.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
23. All equipment must be checked regularly for oil and fuel leaks before being operated.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
24. Contaminated wastewater must be managed by the site manager to ensure existing water resources in the vicinity of the site are not contaminated.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
25. The following measures must be included as part of the management of the site during the operational phrase:			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***

monitoring storm water exit points; fill in and re-vegetate eroded areas; regularly maintain storm water structures to maintain efficiency. 26. All building plans must be submitted to and approved by the Msunduzi Municipality for approval prior to construction commencing.			Noted. Requirement included as part of the EMP. ***Refer to Appendix F.***
<u>Comments on the FBAR:</u> 1. Page 13 makes reference to 'the service agreement between the local authority and the developer will be finalized as soon as the EIA authorization is issued'. <u>Written confirmation from all relevant departments within the Msunduzi Municipality</u> (i.e. Storm Water Management, Transportation, Roads) is needed as part of the BAR and environmental authorization process in order to confirm that each department has the capacity to service the proposed development. 2. Page 27 states 'the developer of the N12 industrial township (on the remainder of the study area) already appointed another EAP for the relevant external services application'. Please provide some clarity on this as the Municipality is not aware of any proposed industrial townships near the site. 3. Page 32 makes reference to the Msunduzi Municipality C-Plan; this should read Environmental Management Framework (EMF) and not C-Plan.	Shannon Farnsworth **City of Choice – Pietermaritzburg Msunduzi Municipality**	16 May 2013	This written confirmation required by the Msunduzi Municipality should be made a condition of the ROD. Correction made. Correction made.

4. Page 57 under point 3 – Mitigation makes reference to wetland buffers and wetland areas. As mentioned in the Specialist Wetland Delineation Assessment prepared by Eco-pulse, there is wetland habitats currently present on the site.			This should be made a condition of the ROD.
5. A copy of the storm water management plan must be submitted to this Unit as well as to the Storm Water Management Unit of the Msunduzi Municipality for comment prior to construction commencing.			This should be made a condition of the ROD.
6. A copy of the Decommissioning Plan must be submitted to this Unit.			This should be made a condition of the ROD.
7. The applicant should pursue Green Building Designs and Principles such as solar power, orientating the building along an east-west axis where the main façade faces north to promote the use of natural light and thermal regulation etc.			Green Building Designs and Principles will be pursued as far as possible.
8. Page 18 of the Storm Water Management Plan and Flood Line Delineation Report prepared by Jeffares & Green Consulting Engineers states that 'the bowling green and parking lot of the bowls club will be affected by the construction of the retaining wall under the 1:100 year flood conditions'. **It should be brought to the applicants' attention that this site, the Bowling Green directly adjacent to the Foxhill spruit (Erf 752 portion 5, PMB), is currently in the process of a subdivision and rezone application in order to develop a**			There is currently a concrete wall in the position of the proposed storm water management structure (also a proposed wall), which has been acting as flood management structure for many years. The appointed flood management engineers however indicated that they cannot take the existing concrete structure into consideration when determining the pre- and post-construction flood lines. When they compiled their flood line drawings they ignored the current concrete wall and therefore the pre-development flood

proposed three story eye specialist centre.			lines appear to cut across the study area. Even though the engineers considered the site without the concrete wall (apparently the concrete wall was not designed as a storm water management structure) the flood line will actually remain unchanged after the construction of the new flood management wall/structure, because it will only replace the existing concrete wall. The post-construction flood line (as indicated on the drawings) is actually very similar to the current pre-development flood line (if the existing concrete wall is taken into consideration). The floodline will actually remain unchanged and therefore we are of the opinion that it will not be necessary to obtain a Section 21 WUL and we requested that the engineers amend their flood management report to confirm the current flood management functions of the concrete wall. We are of the opinion that the development will not alter the flood lines at the Bowling Green Site. Did the developers of the Eye Specialist Centre compile and submit and EIA application for this development? Why was the applicant not informed of the development? Please supply the contact details of the developer.

9. The landscape site development plan (H L 0005 Site Plan) done by Habitat Landscape Architects dated 04 August 2010 seems to show the incorrect location of the cell phone tower towards the east of the site when in fact this tower is situated to the south of the site. The plan makes use of Acacia xanthophloea in the car park, this is not recommended as these trees drop thorny branches, provide little shade and the root systems will lift paving. The landscape plan also only includes 7 plant species within a repeated design, more variety and colour should be encouraged. This unit requests that future landscape plans be done in consultation with this unit and a copy of the draft landscape plan is to be submitted to his unit for comment and approval prior to commencement.			We agree. This should be made a condition of the ROD.
10. The use of Bioswales for water harvesting should be pursed as part of the final landscape plan. Series of bioswales can be placed between rows in the parking lot, this will allow for slow percolation into the soil and harvesting of excess stormwater which can then be used for irrigation.			The storm water engineers will take this recommendation in consideration when compiling and planning the final storm water management plans.
11. The following must be included in a **revised Final Environmental Management Programme (AMPr):** • The appointed ECO is to provide basic environmental awareness training to all staff working on site to the commencement of any construction activities. • Construction staffs are			Noted. All requirements have been included in the Revised EMPr. Annexure F.

to make use of facilities provided for them, as opposed to alternatives. Using surrounding areas as a toilet facility is strongly prohibited. • Chemical toilets should be placed outside 32m from any watercourse i.e. the Foxhillspruit. A registered chemical waste company is to be used to remove waste from the chemical toilets on site. Documentation for this must be kept by the contractor for review purposes by the ECO if needed. • Construction staff shall not be permitted to use any watercourse adjacent to the site for the proposed of bathing or washing of clothing. • All concrete mixing is to take place on mixing boards to prevent contamination of groundwater. • All equipment must be checked regularly for oil and fuel leaks before being operated. • During the operational phase the stormwater exit points and structures must be regularly monitored and maintained.			
12. A copy of the revised EMPr, if commissioned, must be submitted to this Unit for comment.			Noted. This should be made a condition of the ROD.
13. The appointed ECO must register with this unit, providing contact details, a schedule of site visits and audit reports.			This requirement has been included as part of the EMPr.
14. As a condition of the Environmental Authorization, if granted, a **Memorandum of**			Noted. This should be made a condition of the ROD.

Agreement between the Msunduzi Municipality and the applicant (O & T Development (Pty) Ltd) for the upgrade and rehabilitation of the Foxhill Spruit and its associated open spaces as mentioned on page 25 of the FBAR must be developed. The following must be included in the agreement: • The alien invasive plant clearing plan and rehabilitation plan should be attached to the revised Final Environmental Management Programme. • The extent of the area to be rehabilitated must be clearly defined as well as the number of follow-up alien invasive clearings. • The Environmental Management Unit shall compile a list of alien invasive plants that should be cleared as part of the alien invasive plant clearing plan. • Compliance with the above plans shall be monitored by the independent Environmental Compliance Officer appointed by O & T Development (Pty) Ltd for the construction and operational phases of the development.			
We acknowledge receipt of your invitation for comment with regards to the proposed shopping centre. The object of Amafa is to administer, conserve and protect heritage resources of the Province within the terms of KZN Heritage Act no. 4 (2008) and the National Heritage Resources Act No 25 of 1999. The Amafa Built Environment section was consulted for provision of input on the area of proposed development.	Bernadet Pawandiwa **Amafa Kwazulu Natal - Heritages**	12 June 2013	Noted. The procedures for environmental incidents are included in the EMPr.

They confirmed that the proposed area of development has no known heritage resources that may be damaged. You are also required to adhere to the below-mentioned recommendations: **Conditions:** 1. Amafa should be contacted if any heritage objects are identified during earthmoving activities and all development should cease until further notice. 2. No structures older than sixty years or parts thereof are allowed to be demolished altered or extended without a permit from Amafa. 3. No activities are allowed within 50m of a site, which contains rock art. 4. Amafa should be contacted if any graves are identified during construction and the following procedure is to be followed: • Stop construction • Report finding to local police station • Report to Amafa to investigate.			
1. **Sewage and Wastewater Management** 1.1 It is noted that the sewage will be disposed via municipal sewer reticulation. There must be no connection to the sewer reticulation system until the Darvill WWTW has been upgraded to accept additional quantity of sewage. Proof of this should be submitted to this	N.M. Mokoena **Water Affairs**	13 June 2013	Noted. This should be made a condition of the ROD.

Department in writing.			
1.2 The sewage treatment works must be capable of handling the additional quantities of sewage.			Noted.
1.3 The works would have to be upgraded should its present state be inadequate to handle the additional loads.			Noted.
1.4 Please note that This Department **does not** support any development with no availability of sanitation and/or sewage treatment and disposal.			Noted.
2. **Solid Waste Management**			
2.1 Removal and disposal of waste to a permitted waste disposal site is required and this is the responsibility of the applicant.			This is included as a mitigation measure in the revised EMPr.
2.2 All waste stored prior to being safely removed must not cause any surface and groundwater pollution or a health hazard.			This is included as a mitigation measure in the revised EMPr.
2.3 The recycling of suitable material (i.e. glass, paper, plastic, etc) is encouraged by this Department.			This is included as a mitigation measure in the revised EMPr.
2.4 Contaminated/hazardous materials must be disposed off at a permitted hazardous landfill site that is authorized to accept such waste material.			This is included as a mitigation measure in the revised EMPr.
3. **Stormwater Management**			
3.1 It is important that stormwater is properly managed both during and after construction activities.			This is included as a mitigation measure in the revised EMPr.
3.2 After construction, the site should be contoured to ensure			This is included as a mitigation measure in the revised EMPr.

free flow of runoff and to prevent ponding of water. 3.3 Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution or result in damage to properties downstream of any stormwater discharge. 4. **Erosion Control** 4.1 Soil erosion on site must be prevented at all times i.e. pre-, during- and post- construction activities. 4.2 Erosion control measures to be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. Such measures could include the use of sand bags, hessian sheets, retention or replacement of vegetation. 5. **Wetlands, Riparian areas and water resources** 5.1 It is noted from the Wetland delineation assessment report dated April 2013 by Adam Teixeira-Leite & Douglas Macfarlane that no wetland habitat was identified at the project site. 5.2 No development should occur within the 1:100 year floodline due to the risk involved. 5.3 Adequate measures must be put in place to protect the water resource(s) that run through the said property from being polluted and/or degraded. 5.4 Mr Norman Ward from the Water Resources Management Section of this Department must be contacted on (031) 336 2700 in order to			This is included as a mitigation measure in the revised EMPr. This is included in the EMPr. This is included in the EMPr. This is included as a mitigation measure in the revised EMPr. This is included as a mitigation measure in the revised EMPr. Noted

obtain the necessary authorizations (license, etc.), should there be any **alteration** to the bed, banks, course or characteristics of a watercourse or any **impedance or diversion** of flow of a water course as well as any **abstraction** and/or **storage** of water in terms of section 21 of National Water Act. 6. **General** 6.1 The storage of materials, chemicals, fuels etc to be used during the construction phase must not pose a risk to the surrounding environment. Temporary bunds must be constructed around chemical or fuel storage areas to contain possible spillages. 6.2 Stockpiling of soil or any other materials used during the construction phase must not be allowed on or near steep slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface runoff. The developer must control and establish suitable mitigation measures to prevent the erosion of the stockpiles. 6.3 It is important that any significant spillages of chemicals, fuels, etc. during the construction phase is reported to this office and other relevant authorities. In the event of a spill, the following steps can be taken: • Stop the source of the spill • Contain the spill • All significant spills must be reported to this			This is included as a mitigation measure in the revised EMPr. This is included in the EMPr. Noted. The EMP includes procedures for environmental incidents.

Department and other relevant authorities • Remove the spilled product for treatment or authorized disposal • Determine if there is any soil, groundwater or other environmental impact • If necessary, remedial action must be taken in consultation with this Department • Incident must be documented. 6.4 This Development must not be in conflict with local municipality by-laws or other legislation. 6.5 The Department notes the content (i.e. responsibilities and conditions) as outlined in the EMPr. Compliance to the approved EMP must be audited regularly by the designated Environmental Control Officer. 6.6 Notwithstanding the above, the responsibility rests with the applicant to identify any sources or potential sources of pollution from his undertaking and to take appropriate measures to prevent any pollution of the environment. Failure to comply with the requirements of the National Water Act, 1998 (Act 36 of 1998) could lead to legal action being instituted against the applicant.			Engela? Noted. Noted. This should be made a condition of the ROD.

APPENDIX C

Listing Notices 1 and 2 are applicable on a National Basis and the activities as listed in Listing Notice 3 are province specific. If listed activities in Listing Notices 1 and 3 are triggered, the applicant must compile and submit a Basic Assessment Report (BAR) and if activities listed in listing notice 2 are triggered the applicant must follow a full EIA Process. ***Implications for the Proposed Development:*** The proposed development only triggers activities in Listing Notice 1 and therefore it will only be necessary to submit a BAR.		
National Water Act, 1998 (Act No. 36 of 1998)	**National & Provincial**	**20 August 1998**
The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account, amongst other factors, the following: ▪ Meeting the basic human needs of present and future generations; ▪ Promoting equitable access to water; ▪ Promoting the efficient, sustainable and beneficial use of water in the public interest; ▪ Reducing and preventing pollution and degradation of water resources; ▪ Facilitating social and economic development; and ▪ Providing for the growing demand for water use. In terms of the Section 21 of the National Water Act, the developer must obtain water use licenses if the following activities are taking place: a) Taking water from a water resource; b) Storing water; c) Impeding or diverting the flow of water in a watercourse; d) Engaging in a stream flow reduction activity contemplated in section 36; e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);		

f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; g) Disposing of waste in a manner which may detrimentally impact on a water resource; h) Disposing in any manner of water which contains waste from or which has been heated in any industrial or power generation process; i) Altering the bed, banks, course or characteristics of a water course; j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and k) Using water for recreational purposes. The National Water Act also required that (where applicable) the 1:50 and 1:100 year flood line be indicated on all the development drawings (even the drawings for the external services) that are being submitted for approval. ***Implications for the Proposed Development:*** In terms of Section 21 of the National Water Act, the installation and upgrading of the external services will most probably require some section 21 Water-Use Licenses (WULA) or General Authorisations (GA). The developer of the industrial township (on the remainder of the study area) already appointed another EAP for the relevant external services applications (EIA and WULA/GA applications). These applications will therefore not form part of this application. Bokamoso had a meeting (June 2012) regarding the possible activities that could be triggered in terms of S21 of the NWA and according to the official at DWA (Ms. Manisha Thakurdin) no S21 WULA will be required, because the watercourse (the Foxhill Spruit) is not a natural watercourse and the study area is not affected by any wetlands. The Department however mentioned that the Existing Liberty Mall site also incorporates sections below the 1:100 year flood line and certain flood management measures had to be implemented in order to prevent the flooding of		

the permanent structures on the site. The DWA official requested that the flood management measures implemented at the Liberty Mall be considered for purpose of the proposed new Woodburn Shopping Centre, especially if the plan is to place some basement parking below the flood line. The developer/ applicant took this advice from DWA into consideration and appointed the storm water engineers of the Liberty Mall (Jefarres & Green) to assist with the compilation of the storm water management concept for the proposed Woodburn Development. Unfortunately this process caused some severe delays in the application process, because the applicant and the EAP wanted to provide DWA with workable solutions for consideration during the EIA process. ***Refer to Appendix D(i) for a copy of the Jeffares and Green report***		
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	**National**	**2004**
The objectives of this Act are- *(a)* within the framework of the National Environmental Management Act, to provide for- (i) the management and conservation of biological diversity within the Republic and of the components of such biological diversity; (ii) the use of indigenous biological resources in a sustainable manner; and (iii) the fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources; *(b)* to give effect to' ratified international agreements relating to biodiversity which are binding on the Republic; *(c)* to provide for co-operative governance in biodiversity management and conservation; and *(d)* to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.		

27/06/2013

Bokamoso

From: Bokamoso <lizelleg@mweb.co.za>
Sent: 27 June 2013 11:42 AM
To: 'mokoenan@dwa.gov.za'
Subject: Woodburn Boulevard Shopping Centre

Dear Miss Mokoena,

Thank you for the comments received, but it is in total contradiction with the inputs received from your Department during a meeting at your offices in Durban.

We specifically included a summary of the meeting in our DBAR and FBAR.

During the meeting at your offices I mentioned that more than 50% of the study area lies below the 1:100 year flood line. You indicated that it will be possible to construct the shopping centre below the flood line and you recommended that the engineers apply similar floor management measures than the measures applied at the Liberty Mall.

You also recommended that the parking / basement parking for the shopping centre be constructed at ground level and that the actual shopping centre facilities be elevated above the 1:100 year flood line. Your Department furthermore indicated that it will not be necessary to apply for any S21 WUL, because the Foxhill spruit is a manmade channel (the stream has already been altered). The additional inputs from the engineers (Jefarres & Green – the engineers responsible for the Liberty Mall flood management concepts) delayed our application process significantly, because we wanted to ensure that the flood management of the site is in line with your requirements and the contradicting comments in your correspondence letter, is to say the least very surprising.

As environmental consultants we went through the effort (at the beginning of the application process) to meet with your Department in order to determine the requirements for the development (i.e. in terms of flood management and S21 WUL requirements) and we based the remainder of the engineering inputs and the application process on such inputs.

Due to the fact that it was indicated that no S 21WUL will be required, no S21 WULA were compiled and submitted.

mentioned in the BAR, this development was approved in a DFA town planning process and DWA was also involved in that process.

Please peruse pages 27 and 28 of the BAR, which includes a summary of the meeting with your Department and reconsider the comments issued in your comment letter in more detail.

We are also willing to attend a second meeting at your offices in Durban if there are any aspects to discuss in more detail.

Please do not hesitate to contact us if you have any queries regarding this matter.

Regards,

Lizelle Gregory

Bokamoso
Landscape Architects &
Environmental Consultants cc.

T: (+27)12 346 3810 I F: (+27) 86 570 5659 I E: lizelleg@mweb.co.za I www.b.bokamoso.biz
36 Lebombo Street, Ashlea Gardens, Pretoria I P.O. Box 11375 Maroelana 0161

25/09/2012 (5)

Bokamoso

From: Bokamoso <ontvangs@bokamoso.net>
Sent: 25 September 2012 03:13 PM
To: 'Shannon Farnsworth'
Subject: RE: WOODBURN SHOPPING CENTRE FINAL BAR

Dear Shannon,

We are currently finalising the BAR. I recently had a meeting at Water Affairs in Durban and the Department confirmed that no Section 21 Water-Use license will be required and that they will support the project if we apply the same design principles as used at the Liberty Midlands Mall.

I contacted the Civil Engineer and requested more detailed drawings for inclusion as part of the BAR to be submitted to the authorities for consideration.

We are planning to finalise the final BAR within the next 2 weeks.

A copy of the final BAR will be supplied to you for perusal and comment.

Regards,

Lizelle Gregory

From: Shannon Farnsworth [mailto:Shannon.Farnsworth@msunduzi.gov.za]
Sent: 25 September 2012 07:51 AM
To: Bokamoso
Subject: WOODBURN SHOPPING CENTRE FINAL BAR

Hi Lizelle,

Hope all is well!
Can you please inform me on the current status of the Woodburn shopping centre development? Has the final BAR been completed? Would a water license be needed?

Kind Regards,
Shannon

Shannon Farnsworth
Environmental Scientist
Environmental Management Unit
Msunduzi Municipality
: P O Box 321
Pietermaritzburg
3200
: 033 392 3243

Bokamoso

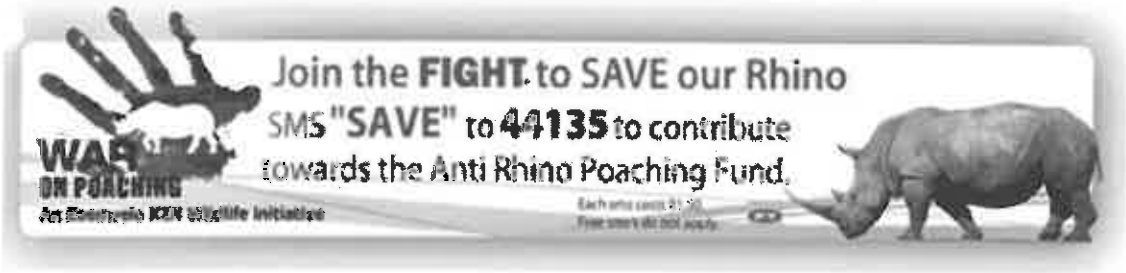
From: Shannon Farnsworth <Shannon.Farnsworth@msunduzi.gov.za>
Sent: 25 September 2012 07:51 AM
To: Bokamoso
Subject: WOODBURN SHOPPING CENTRE FINAL BAR

Hi Lizelle,

Hope all is well!
ɜn you please inform me on the current status of the Woodburn shopping centre development? Has the final BAR been completed? Would a water license be needed?

Kind Regards,
Shannon

Shannon Farnsworth
Environmental Scientist
Environmental Management Unit
Msunduzi Municipality
P O Box 321
Pietermaritzburg
3200
: 033 392 3243
: shannon.farnsworth@msunduzi.gov.za



APPENDIX D

16/7/2013

User1

From: Bokamoso <lizelleg@mweb.co.za>
Sent: Monday, July 15, 2013 1:26 PM
To: user4@bokamoso.net; user12@bokamoso.net
Cc: user1@bokamoso.net
Subject: FW: Woodburn Development
Attachments: Special Area 30.docx; WoodburnZoning.bmp; Original Site Development Plan.pdf; Developers Proposal.pdf

From: Walter Van Rensburg [mailto:Walter.VanRensburg@msunduzi.gov.za]
Sent: 15 July 2013 12:42 PM
To: lizelleg@mweb.co.za
Cc: ventureprop@icon.co.za; vcstats@yahoo.com
Subject: Woodburn Development

Good morning Lizelle

I herewith confirm that Portion 5 of Erf 4346 is situated within the "Special Area 30" zone as approved by the DFA Tribunal. Attached is a copy of the Town Planning Scheme Controls for "Special Area 30".

Regards
Walter

W B Janse van Rensburg
MTRP : UOFS TRP(SA)
PROFESSIONAL PLANNER
Pr.Pln (SACPLAN Reg No. A/166/2010)

Tel no : 033-3922140
Fax no : 033-3922576
Fax to e-mail : **0867702999**
e-mail : walterv@msunduzi.gov.za

MSUNDUZI MUNICIPALITY


PIETERMARITZBURG
175
1838 - 2013

3.19.30 Special Area 30 *(nb DFA Tribunal decision)*

3.19.30.1 In addition to the general provisions of the Scheme, the following shall apply exclusively to the Special Area 30 zone.

3.19.30.2 Use of Land and Buildings

3.19.30.2.1 Reference to Map -cross-hatched black, being Parts of Erven194, 298, and 4346, Pietermaritzburg, and part of Rem of Townlands being the Collegians Club/Woodburn Rugby Stadium, off Boshoff Street : Scottsville.

3.19.30.2.2 Expressly Permissible Development or uses of Land or Uses of Buildings -

1.6.4 Business Premises, subject to Proviso 3.19.30.3.1

1.6.28 Residential Building including Flats but excluding an Hotel, subject to Proviso 3.19.30.3.4.

1.6.29 Restaurant, subject to Proviso 3.19.30.3.1

1.6.33 Shop, subject to Proviso 3.19.30.3.1

1.6.36 Specialised Office, subject to Proviso 3.19.30.3.2

3.19.30.2.3 Development or Uses of Land or Uses of Buildings Permitted by Special Consent -

1.6.15 Motor Saleroom, subject to Proviso 3.19.30.3.3

1.6.16 Motor Workshop (ancillary to a Motor Saleroom and excluding panel beating, spray painting and engine and chassis overhauls)

1.6.24 Place of Public Entertainment, subject to Proviso 3.19.30.3.1.

1.6.28 Residential Building including Flats and an Hotel, subject to Proviso 3.19.30.3.4.

3.19.30.2.4 Expressly Prohibited Development or Uses of Land or Uses of Buildings -

All Development or uses of Land or uses of Buildings not under Clause 3.19.30.2.2 hereof.

3.19.30.3 Provisos -

3.19.30.3.1 The total floor area to be occupied by Business Premises, Motor Showroom and ancillary Motor Workshop, Restaurants and Shops, shall not exceed 13 000m².

3.19.30.3.2 The total floor area to be occupied by Specialised Offices, shall not exceed 7 500m².

3.19.30.3.3 In the event of motor salesrooms and an ancillary Motor Workshop replacing the retail centre indicated on the proposed concept plan attached as Annexure 'D', the area thereof shall not exceed a total floor area of 8000m².

3.19.30.3.4 The total floor area for the residential development, shall not exceed 11 000m².

3.19.30.3.5 The development of the site shall be generally in accordance with the plan submitted and attached as Annexure 'D'. Provided that a site development plan which shall not be inconsistent with the above mentioned plan, indicating the final positioning and extent of the various components and elements of the overall development, shall be submitted to and approved by the Council, prior to the submission of building plans. Provided further that the site development plan may also indicate possible subdivisions of the development.

3.19.30.4 Density and Height Control

TYPE OF BUILDING OR USE OF LAND	MAX FLOOR AREA OR MAX No. OF UNITS	MAX SITE COVERAGE	MAX HEIGHT
Residential units	11 000 m²	Per site development plan	3 Storeys
Specialised Offices	7 500m²	Per site development plan	1 Storey
Business Premises (Including Motor Showroom and ancillary Motor Workshop)	13 000 m²	Per site development plan	1 Storey
Motor Showroom	8 000 m²	Per site development plan	1 Storey

3.19.30.5 Building Lines, Side and Rear Spaces

Refer to the approved site development plan for building lines and distances to other site boundaries.

3.19.30.6 Minimum Site Areas / Frontages

3.19.30.6.1 The parcels of land on either side of Boshoff Street shall be initially consolidated. Provided that the Council may allow the subdivision of the site in a manner not inconsistent with the approved site development plan.

3.19.30.7 Provision of On-site Parking

3.19.30.7.1 The following on-site parking shall be provided for Business Premises and Shops -

1,2m² of gross parking for every 1m² of gross Floor area, other than the Floor area of any use for which on-site parking must be provided in accordance with the requirements for those uses where they appear elsewhere in the Scheme.

3.19.30.7.2 The following on-site parking shall be provided for the residential component -

1 bays for every unit, in addition to 2 conveniently located visitor bays for every 5 units.

3.19.30.7.3 The following on-site parking shall be provided for Specialised Offices -

1 bay for every 25m² of nett office space, other than office space occupied by medical or dental practitioners;

1 bay for every 15m² of nett office space occupied by medical or dental practitioners.

3.19.30.7.4 On-site parking requirements for any other uses shall be in accordance with the requirements for those uses, as provided for elsewhere in the Scheme.

3.19.30.7.5 The technical requirements for on-site parking shall be in accordance with Appendix 2 to the Scheme.

3.19.30.8 Landscaping

Landscaping shall be undertaken as an integral part of the development of the site, and shall be indicated on the approved site development plan.

3.19.30.9 Environmental Management

The developer shall, as an integral part of the development of the site, give effect to the requirements of the Department of Agriculture and Environmental Affairs.

3.19.30.10 Traffic Management

3.19.30.10.1 The developer shall give effect, to the recommendations contained in the traffic study dated October 1999 by Africon Consulting.

3.19.30.10.2 A single point of access only shall be permitted between the site and Boshoff Street, the location thereof to be agreed to by the City Engineer.

3.19.30.11 Hydrology Report

3.19.30.11.1 A full hydrological impact assessment must be carried out by competent Professional Engineers early in the design stages of the project and must take into account the interests of upstream and downstream property owners.

3.19.30.11.2 The study shall indicate where and how the generated runoff can be detained on site through the use of parking areas, sportsgrounds *etc* thus ensuring that the post-development runoff does not exceed the pre-development runoff.

3.19.30.12 Site Development Plan

3.19.30.12.1 A site development plan shall be submitted and approved by the Council.

3.19.30.12.2 In the event of the developer wishing to submit separate site development plans for different elements of the development, such site development plans must be accompanied by an overall development framework for the entire site.

3.19.30.12.3 Such site development plans shall, *inter alia*, provide details of the landscaping, environmental management and traffic

management requirements contemplated in 3.19.30.8, 3.19.30.9 and 3.19.30.10 hereof.

3.19.30.13 Other Legislation

The developer shall be entirely responsible for ensuring compliance with any other applicable legislation (*eg* Environment Conservation Act, Water Act)

User1

From: User1 <user1@bokamoso.net>
Sent: Friday, August 23, 2013 6:37 PM
To: grayr@jgi.co.za
Cc: ventureprop@icon.co.za
Subject: RE: Woodburn b- Ane

Dear Ryan

Please note that it is requested that the Architect – Ernest should take the most recent drawing and clearly indicate all levels of the Shopping Centre on the layout. As requested by the Department the Engineer needs to investigate the impacts that the Shopping Centre will have on the floodlines. Thereafter the Storm water Engineer needs to consider the storm water report and indicate mitigation measures. The Storm water Engineer should also then pay specific attention to the pre- and post-construction floodlines after the mitigation measures are applied.

Trust the above is in order. Should there be any other queries in this regard do not hesitate to contact the undersigned.

Kind regards,

Anè Agenbacht
Tel: 012-346 3810
Cell: 083 533 0420
Email: lizelleg@mweb.co.za (Attention: Anè)

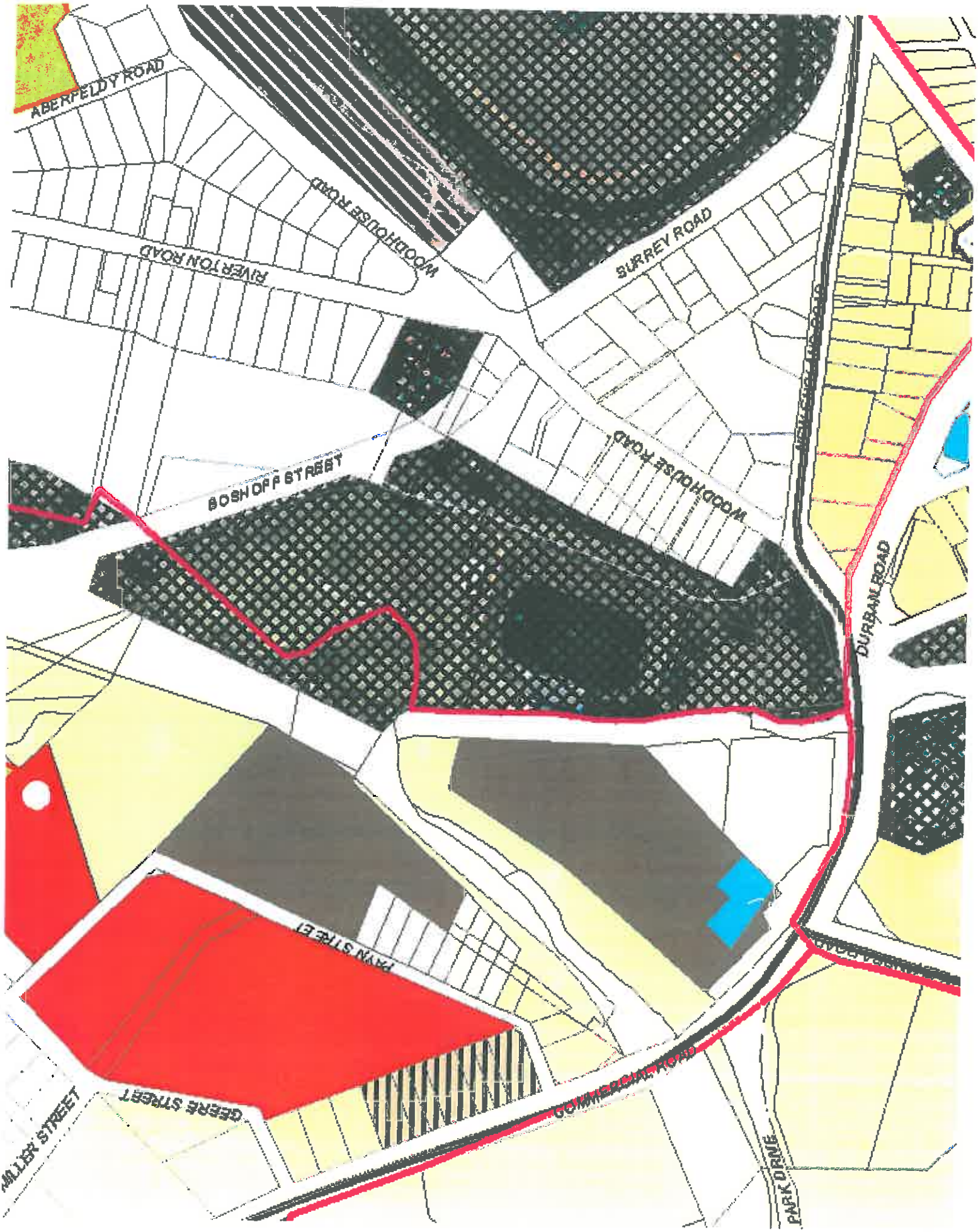
Bokamoso
Landscape Architects &
Environmental Consultants

T: (+27)12 346 3810 I F: (+27) 86 570 5659 I E: lizelleg@mweb.co.za I www.bokamoso.biz
36 Lebombo Street, Ashlea Gardens, Pretoria I P.O. Box 11375 Maroelana 0161

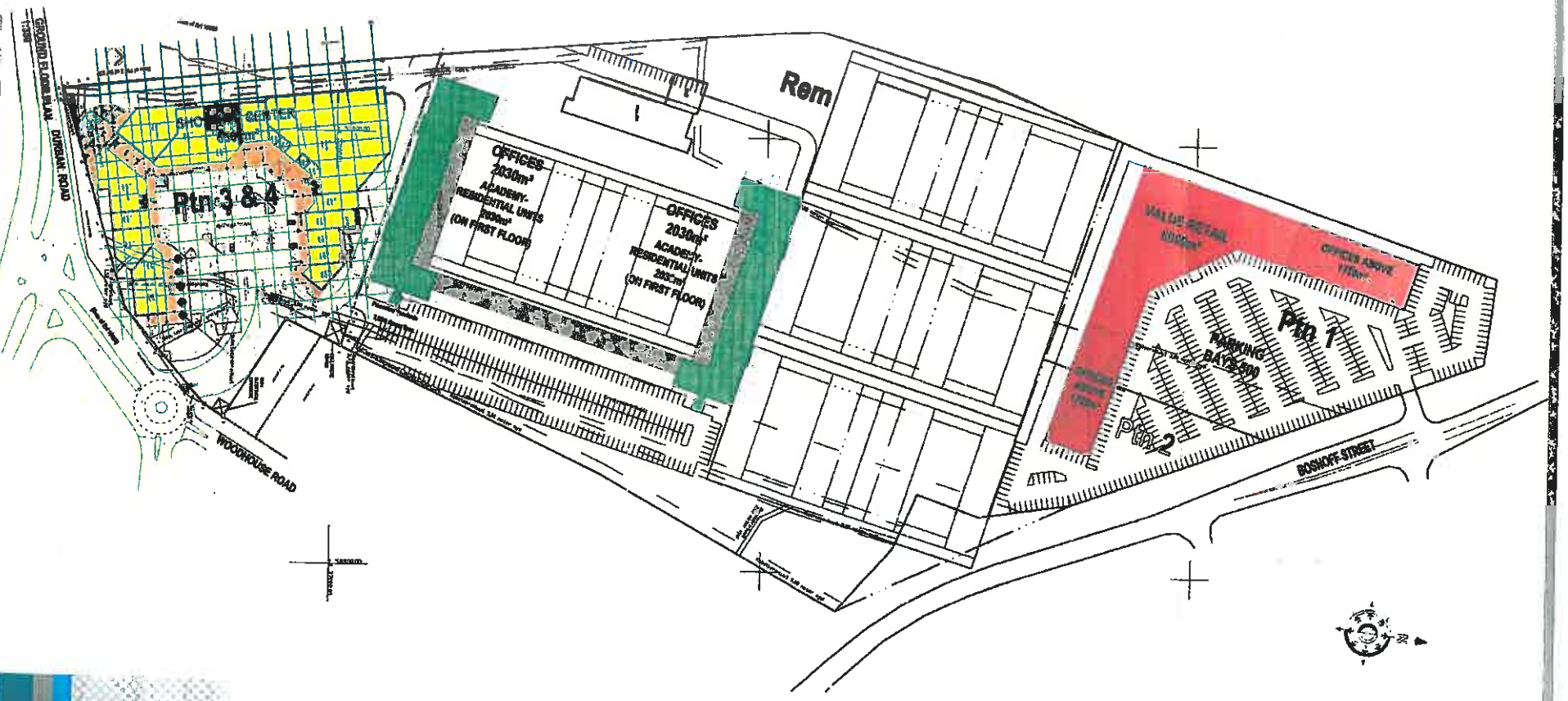
From: User1 [mailto:user1@bokamoso.net]
Sent: Thursday, August 22, 2013 7:12 PM
To: grayr@jgi.co.za
Cc: ventureprop@icon.co.za
Subject: RE: Woodburn b- Ane

Ryan

I'm confirming my facts with my Director Mrs. Lizelle Gregory and will revert back to you as a matter of urgency.


ABERFELDY ROAD
WOODHOUSE ROAD
RIVERTON ROAD
SURREY ROAD
BOSHOFF STREET
WOODHOUSE ROAD
DURBAN ROAD
PARK DRIVE
PARK STREET
GEERE STREET
MILLER STREET

ORIGINAL APPROVED SDP.



Woodburn Boulevard

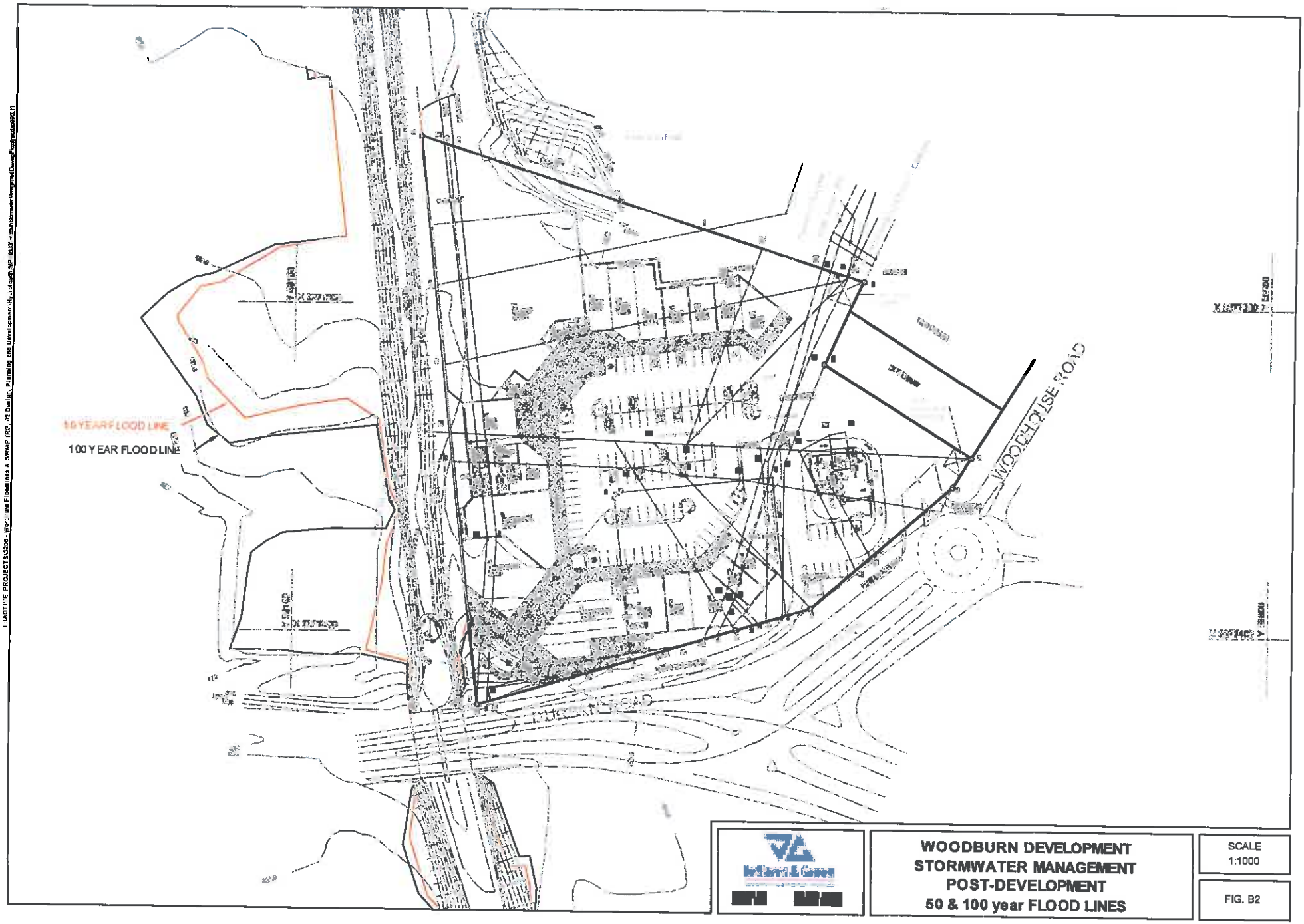
proposed new Shopping Centre

Master Plan

master

APPENDIX E

APPENDIX F



WOODBURN DEVELOPMENT
STORMWATER MANAGEMENT
POST-DEVELOPMENT
50 & 100 year FLOOD LINES

SCALE
1:1000

FIG. B2

15/02/2013

Jeffares & Green
CONSULTING ENGINEERS

PROPOSED WOODBURN DEVELOPMENT

STORMWATER MANAGEMENT PLAN AND FLOODLINE DELINEATION REPORT



ENGINEERING INTEGRITY since 1922

PROPOSED WOODBURN DEVELOPMENT

STORMWATER MANAGEMENT PLAN AND FLOODLINE DELINEATION REPORT

QUALITY VERIFICATION

This report has been prepared under the controls established by a quality management system that meets the requirements of ISO9001: 2008 which has been independently certified by DEKRA Certification under certificate number 90906882

Verification	Capacity	Name	Signature	Date
By Author	Hydrologist	Ernest Oakes		15/02/13
Checked by	Hydrologist	Ryan Gray		15/02/2013
Authorised by	Executive Associate	Simon Johnson		15/02/13

Prepared for:

Brava Development Consultants
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3201

Tel: 033 345 0502
Fax: 033 342 7513

Prepared by:

Jeffares and Green
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Hilton

Tel: 033 343 6700
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Jeffares & Green
ENGINEERING & ENVIRONMENTAL CONSULTING

TABLE OF CONTENTS

1 INTRODUCTION

O & T Development (Pty) Ltd (O & T Development) appointed Jeffares & Green (Pty) Ltd (J&G) to undertake a 1:50 year design flood stormwater management plan (SWMP) and floodline delineations for the 1:50 and 1:100 year design floods for a proposed development at Woodburn. The development site is located in Pietermaritzburg in the Msunduzi Local Municipality within KwaZulu-Natal (**Figure 2-1**). J&G were appointed to proceed with the SWMP and floodline delineations on the 14th November 2012 by O & T Development on the basis of quotation 12/SW61/RG dated 8th October 2012.

The objectives of this investigation were as follows

1) Assess the impact that the proposed development would have on the stormwater system under the 1:50 year return period flood conditions.

2) Determine solutions to channel and attenuate the additional 1:50 year return period stormflows that are generated by the new development at the site.

3) Assess the extents of the inundation areas resulting from the 1:50 and the 1:100 year design flood events, which included assessing a potential mitigation measure to prevent flooding of the site whilst minimising any impact on surrounding infrastructure.

For a floodline investigation, detailed survey data and resultant contour data is required in order to produce accurate floodline delineations. The client was able to provide survey data for the Foxhill Spruit River adjacent to the development site. Contour data at intervals of 5 metres were sourced by J&G and used in conjunction with the supplied survey data in order to create a full coverage of the floodplain. The accuracy of the floodline is determined by the quality of the contour and survey data, hence, the 1:50 and 1:100 year return period floodlines produced in this study are as accurate as the data provided to J&G by the client combined with the 5 m contours used for the floodplains.

2 SITE LOCALITY

The site (**Figure 2-1**) is located in Pietermaritzburg adjacent to the Foxhill Spruit River, a tributary of the uMsunduzi River. The Foxhill Spruit River originates in Foxhill Farm south-south west of Oribi Heights. The site lies to the north of Chief Albert Luthuli Street at the corner of Woodhouse Road. A site plan of the proposed Woodburn development is shown in **Figure 2-2**. The Woodburn rugby grounds are situated to the north of the proposed development site. The site is currently under grassland cover. There is an access road to the Woodburn rugby grounds through the proposed development site. The downstream point of the proposed development site has the coordinates:

29° 36' 42.21" S
30° 23' 24.46" E

Figure 2-1 Locality Plan for the Proposed Woodburn Development Site

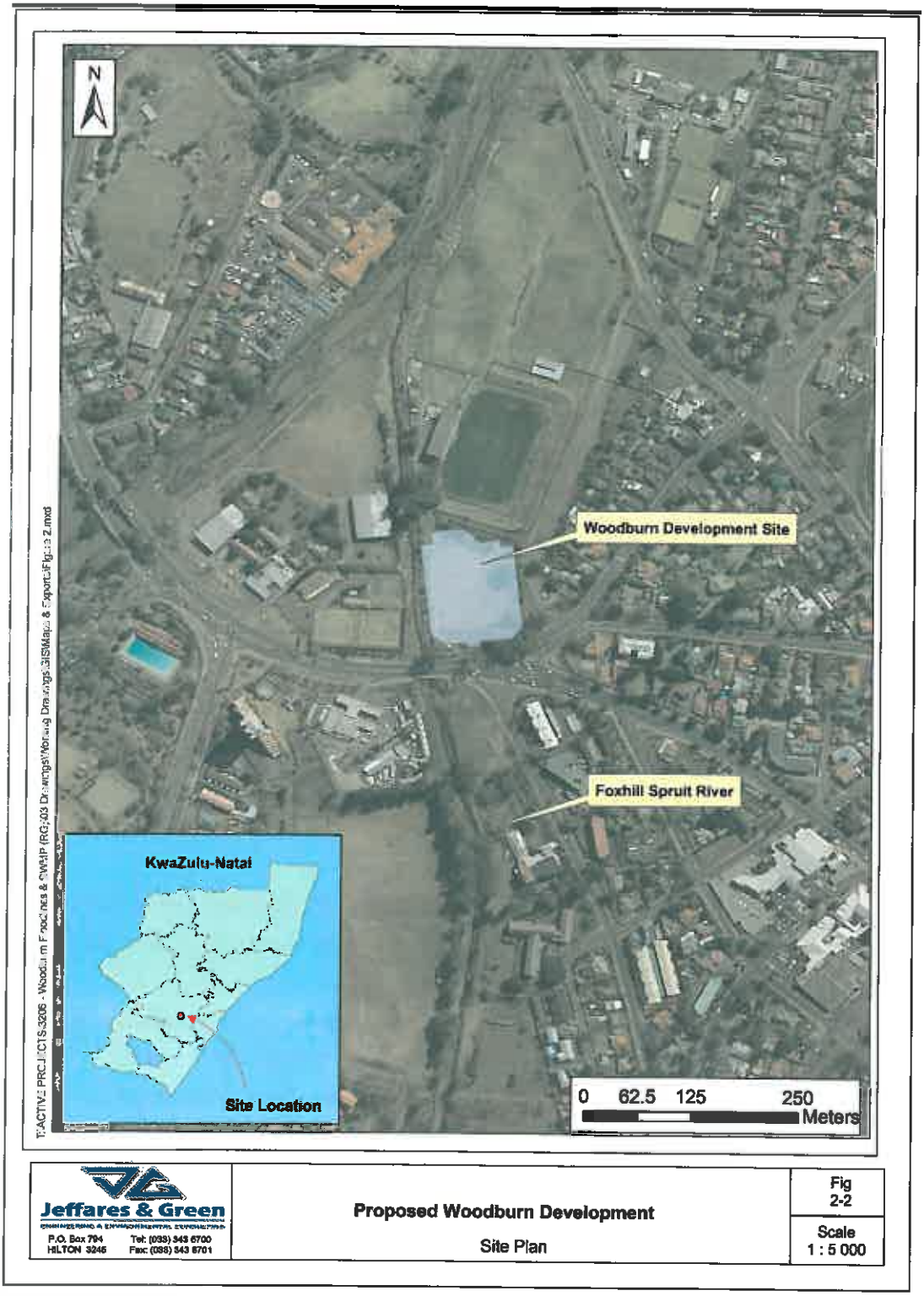


Figure 2-2 Site Plan for the Proposed Woodburn Development Site

3 METHODOLOGY

This section outlines the methodology adopted for this investigation, namely, the selection of the appropriate method for the calculation and determination of the peak discharge for the site and the Foxhill Spruit River Catchment. This was followed by the determination of the extents of the areas inundated by the 1:50 and 1:100 year design floods.

3.1 Stormwater Management Plan Flood Hydrology

The peak discharge for a particular site can be calculated using various methodologies. The method adopted for this study was the Rational Method. The Rational Method is one of the best-known and widely used methods for determining the peak floods of small to medium catchments (100 km^2 or less). The peak flow equation is based on a runoff coefficient (C), average rainfall intensity (I) and the effective area of the catchment (A).

The Rational formula is defined as:

$$Q = 0.278(CIA) \qquad \text{Equation 1}$$

Where:

Q	=	peak flow (m^3/s)
C	=	run-off coefficient (dimensionless)
I	=	average rainfall intensity over catchment (mm/hour)
A	=	effective area of catchment (km^2)

The Rational formula has the following assumptions:

- The rainfall has a uniform spatial distribution across the total contributing catchment;
- The rainfall has a uniform time distribution for at least a duration equal to the time of concentration;
- The peak discharge occurs when the total catchment contributes to the flow occurring at the end of the critical storm duration, or time of concentration;
- C remains constant for the storm duration, or the time of concentration; and
- The return period of the peak flow, T, is the same as that of the corresponding rainfall intensity.

The municipal requirements of the inputs (excluding catchment area) for the Rational Method for the SWMP component of this study were used and are presented in **Table 3-1**.

Table 3-1 Municipal Input Requirements for the Rational Method

	Catchment Area (km^2)	Run-off Coefficient	1:50 yr Rainfall Intensity (mm/hr)
Pre-development	0.018	0.35	165
Post-development	0.018	0.85	165

The level pool routing method was used to assess the pre and post-development stormflow volumes generated at the study site and to quantify the required attenuation volume required to mitigate the impacts of the proposed development on the municipal stormwater system.

3.2 Floodline Determination

The 1:50 and 1:100 year peak discharge values were calculated using the Rational Method. Rainfall data is essential for determining design flood events. For this purpose, design rainfall data was extracted from the six closest rainfall stations for which design rainfall is available using the Design Rainfall Utility developed by Smithers and Schulze (2000). Details of the six closest rainfall stations are presented in **Table 3-2**. The Mean Annual Precipitation (MAP) for the proposed development was determined as 741 mm, as per the gridded design rainfall results based on the relative position of the six closest stations to the site (Smithers and Schulze, 2000). The design rainfall depths were based on the data from the rainfall stations listed in **Table 3-3**.

Table 3-2 Rain Gauge Characteristics Used to Determine the Woodburn Development Catchment Design Rainfall

Station Name	SAWS Number	Distance from Site (km)	Record Used (years)	Mean Annual Precipitation (mm)	Altitude (m)
Ukulinga Agri Res Sta	0239700 A	2.5	33	714	866
Pietermaritzburg	0239577 W	6.5	49	949	819
Botanic Gardens – Pmb	0239605 P	8.0	83	1 001	882
Allerton	0239604 W	9.7	87	1 072	882
Baynesfield Estates	0239585 A	12.1	65	829	838
Thornville	0239676 S	12.6	28	845	853

Table 3-3 Design Rainfall of the Woodburn Development Site

Duration	Return Period (Years) Design Rainfall Depth (mm)						
	1:2	1:5	1:10	1:20	1:50	1:100	1:200
5 min	10.5	15.3	19.3	23.9	31.2	37.9	45.9
10 min	14.4	21.0	26.5	32.9	43.0	52.2	63.2
15 min	17.4	25.3	32.0	39.6	51.8	63.0	76.2
30 min	21.8	31.7	40.0	49.6	64.9	78.8	95.4
45 min	24.8	36.2	45.6	56.6	74.0	89.9	108.8
1 hour	27.3	39.7	50.1	62.1	81.2	98.7	119.4
1.5 hour	31.1	45.3	57.1	70.8	92.6	112.5	136.1
2 hour	34.1	49.7	62.7	77.7	101.6	123.5	149.4
4 hour	39.3	57.3	72.3	89.6	117.2	142.5	172.4
6 hour	42.8	62.3	78.6	97.5	127.4	154.9	187.4
8 hour	45.4	66.1	83.4	103.4	135.2	164.3	198.8
10 hour	47.5	69.2	87.4	108.3	141.6	172.1	208.2
12 hour	49.3	71.9	90.7	112.4	147.0	178.6	216.1
16 hour	52.4	76.2	96.2	119.3	156.0	189.5	229.3
20 hour	54.8	79.8	100.8	124.9	163.3	198.5	240.1
24 hour	56.9	82.9	104.6	129.7	169.5	206.1	249.3
1 day	48.3	70.3	88.7	110.0	143.8	174.8	211.5
2 day	61.3	89.2	112.6	139.6	182.5	221.8	268.4
3 day	70.4	102.6	129.5	160.5	209.8	255.0	308.5
4 day	76.4	111.2	140.3	173.9	227.5	276.4	334.5
5 day	81.3	118.4	149.4	185.2	242.1	294.3	356.1
6 day	85.5	124.6	157.2	194.9	254.8	309.7	374.7
7 day	89.3	130.1	164.2	203.5	266.1	323.4	391.3

The physiographic information (i.e. the river reach and the topography) was prepared in HEC-GeoRAS for input into the hydraulic model HEC-RAS. The flood peaks resulting from the 1:50 and 1:100 year design floods were hydraulically modelled against the merged five metre contour and survey data. The results from HEC-RAS were then exported to HEC-GeoRAS for the final floodline delineations.

From analyses done in ArcGIS 9.3, the land use of the Woodburn development's contributing catchment is approximately 50% urban and 50% rural. The urban component of the land use consists of approximately 88% houses, 2% heavy industry and 10% streets. The rural component of the land use consists of vegetation classified as grasslands. These variables were determined by delineating the various land uses and calculating their respective areas. The soils of the contributing catchment are 50% "Permeable" and 50% "Semi-Permeable" as indicated by soil coverage information of South Africa. The surface slope for each catchment was estimated from a digital terrain model (DTM) created from 20 m contour data, four classes of surface slope (<3, 3-10, 10-30 and 30-100 %) were

identified, this was followed by the determination of their respective areas. Further to the afore-mentioned characteristics of the contributing catchments, characteristics of further hydrological significance at the study site are presented in **Table 3-4**.

Table 3-4 Woodburn Contributing Catchment Characteristics

Area (km^2)	Length of Longest Watercourse (km)	MAP (mm)	Time of Concentration (hrs)	Catchment Centroid (dec deg)		Average Slope (m/m)
				Latitude	Longitude	
10.57	7.88	741.0	1.29 h	29.64909	30.38923	0.02754

As mentioned in the previous section, the HEC-RAS model was used to undertake the hydraulic modelling. Survey data was provided by the client. To further increase the accuracy of the simulations, the survey data and the contour data at intervals of 5 metres were input into ArcMAP (**Figure 3-1**) and merged to create a DTM. This allows for the cross-section elevations to be extracted from the DTM utilising HEC-GeoRAS. This data was subsequently exported into the HEC-RAS model for hydraulic modelling of the previously calculated peak discharge values. The bridge that crosses the Foxhill Spruit River on Chief Albert Luthuli St. to the south of the site was included in the hydraulic modelling to consider its impacts on the 1:50 and 1:100 year flood events. The back-water effects of the Msunduzi River were not taken into account. Once the hydraulic modelling was completed, the resultant floodline was imported into ArcMAP for delineation over the project area.

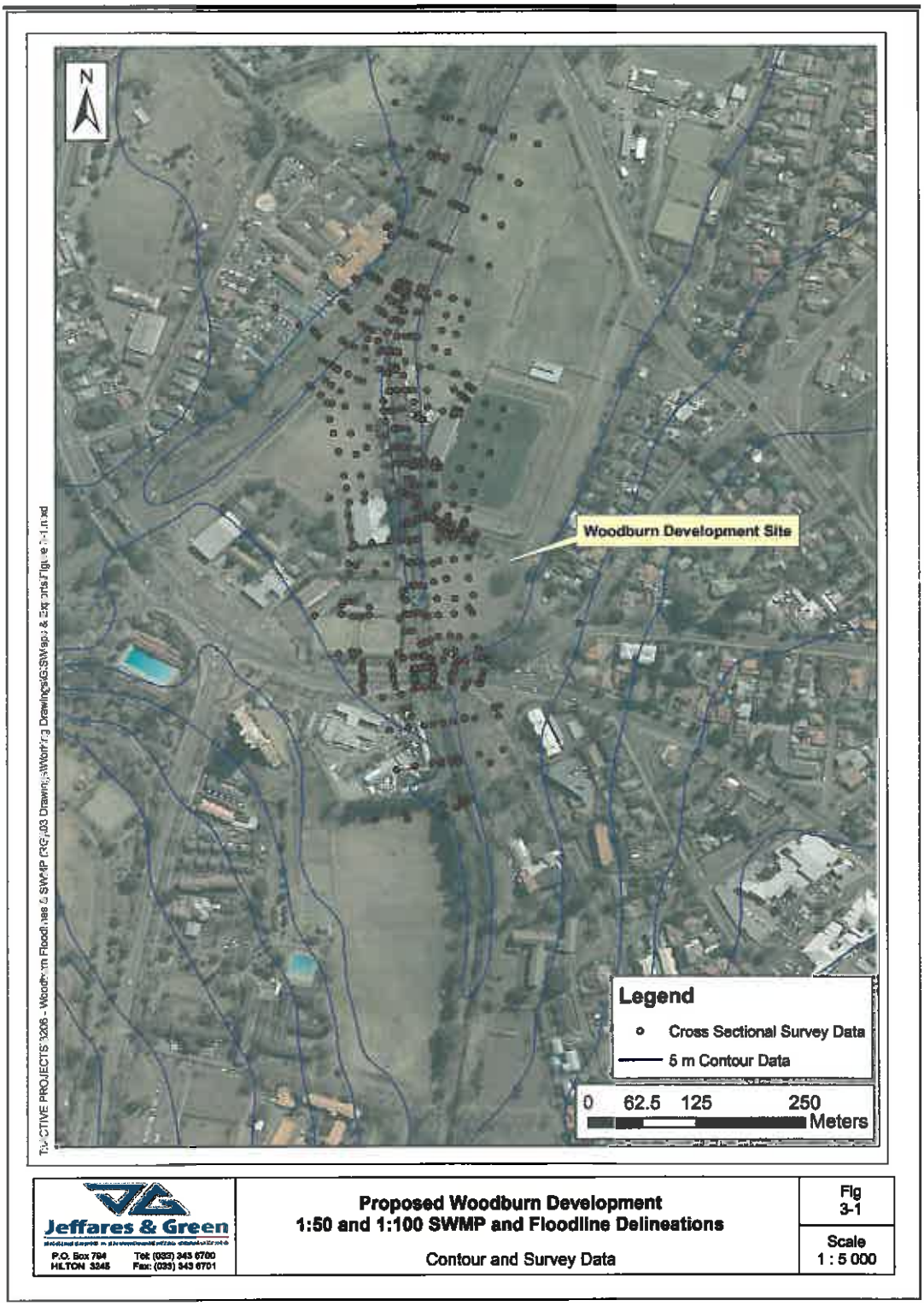


Figure 3-1 Contour Data and Survey Data used for the Determination of the 1:50 and 1:100 Year Floodlines

4 RESULTS

4.1 Stormwater Management Plan Hydrology

The pre- and post-development peak discharge values resulting from the 1:50 year design flood at the site are shown in **Table 4-1**. The resulting pre- and post-development stormwater volumes for the same return period are shown in **Table 4-2**. As part of the requirements of the SWMP, a stormwater attenuation volume of 1 107 m^3 will be required to mitigate the impact of the proposed development (**Table 4-2**). Thus, an engineering solution is required to attenuate the post-development peak to that which occurred under pre-development conditions (i.e. ensuring flood neutrality). The ability of the stormwater management intervention to attenuate the post-development peak is based on the size of the outlet structure and the available storage volume.

Table 4-1 Pre- and Post-Development Design Flood Peak Discharge Values

Peak Discharge	1:50 Year Return Period (years)	
	Pre-development (m^3/s)	Post-development (m^3/s)
Q_p (m^3/s)	0.29	0.70

Table 4-2 Pre- and Post-Development Stormflow Volumes

	Pre-development (m^3)	Post-development (m^3)	Required Attenuation (m^3)
Stormflow Volume (m^3)	783.0	1 890.0	1 107.0

Attenuation is attained by routing the 1:50 year return period peak flow hydrograph through a retention structure/s, that detains or ponds the runoff water and, thereafter, releases the flow at a slower rate (i.e. the pre-development peak flow rate). This, however, means that a volume of water will need to be stored during the period in which inflow (maximum equal to 0.70 m^3/s) is greater than the outflow (maximum equal to 0.29 m^3/s).

A number of SWMP scenarios were considered for this investigation. A scenario that entailed the use of attenuation tanks adjacent to each of the trading areas on the ground level of the proposed development was considered. The stormwater stored in the attenuation tanks would be routed to the Foxhill Spruit River during the 1:50 year design flood event. This would aid in the disaggregation of the total stormwater produced resulting in a lower quantity of runoff produced by the parking lot and additional paved areas. The stormwater generated by the parking lot and additional paved areas would have been directed to an

attenuation pond in the form of a water feature which would release water to the receiving environment at a controlled rate. This approach would have reduced and possibly nullified the need to store a portion of the post-development stormwater in the basement level parking. Additional storage tank options were also considered for the below basement parking area (i.e. sub-terrain) or in the suspended slab of the ground level.

The second SWMP scenario suggested was to raise the basement level parking by concrete or earth fill to counter the effects of the 1:50 year and 1:100 year flood water elevations on the stormwater system discharge outlet submergence. It was suggested that the level of the basement parking be raised to a height which would give sufficient freeboard to allow stormwater temporarily stored in the basement parking lot to be released into the Foxhill Spruit River during the 1:50 year and 1:100 year design flood events without the Foxhill Spruit River backing up into the development through the stormwater system.

After discussions with the client, J&G was instructed to use the following method due to economic reasons. A portion of the stormwater generated by the 1:50 year design flood event would be diverted to the Foxhill Spruit River. The balance of the stormwater would be diverted to the basement parking lot and temporally stored until the recession of the 1:50 year design flood waters. The above-mentioned diversion would be accomplished by a system of appropriately sized pipes situated in a catch pit on the ground level parking (**Figure 4-1**) level and a second set of appropriately sized pipes in a catch pit situated in a basement parking lot. It is recommended that the ground level and basement level catch pits are covered with mentis grating (or similar covering) to prevent blockage of the SWMP infrastructure. The details pertaining to the final SWMP design are discussed in this section. The inundation of the parking areas, including the associated risks to people and property at the site, were discussed with the client and engineer, who were happy to proceed.

The discharge from the system into the receiving environment must equal to, or be less than the pre-development peak of 0.29 m^3/s. The depth to flow relationship for round pipe culverts (Henderson, 1966) was used to determine the discharge at incremental flow depths for three outlet pipes (one outlet pipe with a diameter of 0.4 m and two outlet pipes with a diameter of 0.45 m) at a slope of 0.1% (**Figure 4-2** and **Figure 4-3**).

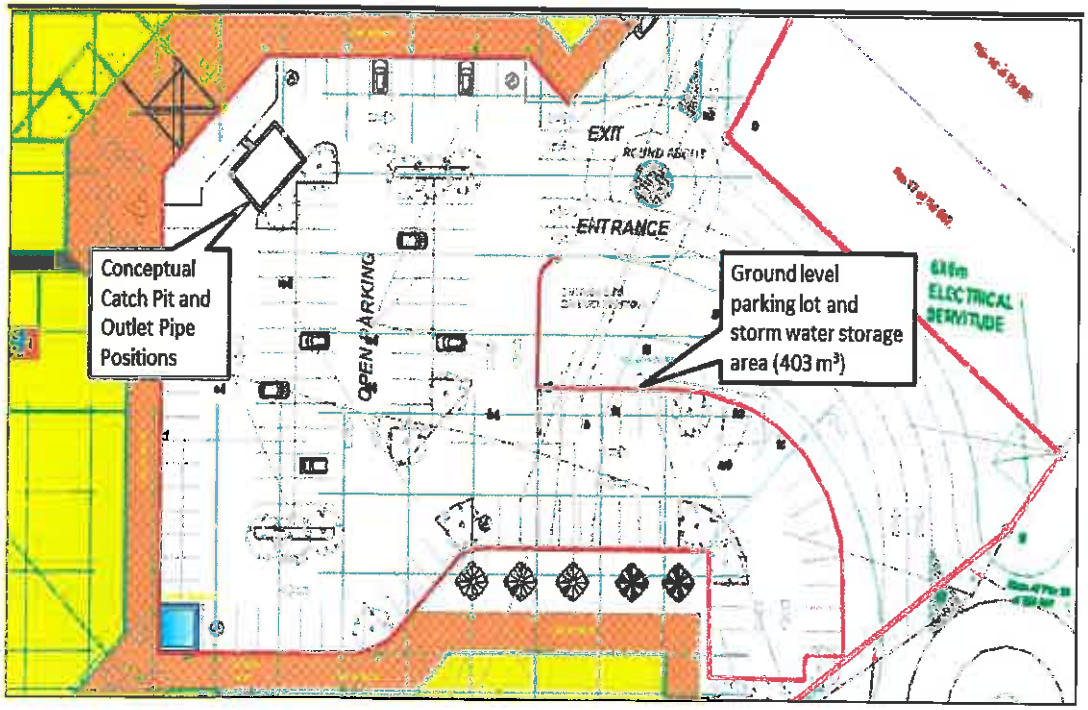


Figure 4-1 Conceptual Plan View of the Ground Level SWMP infrastructure

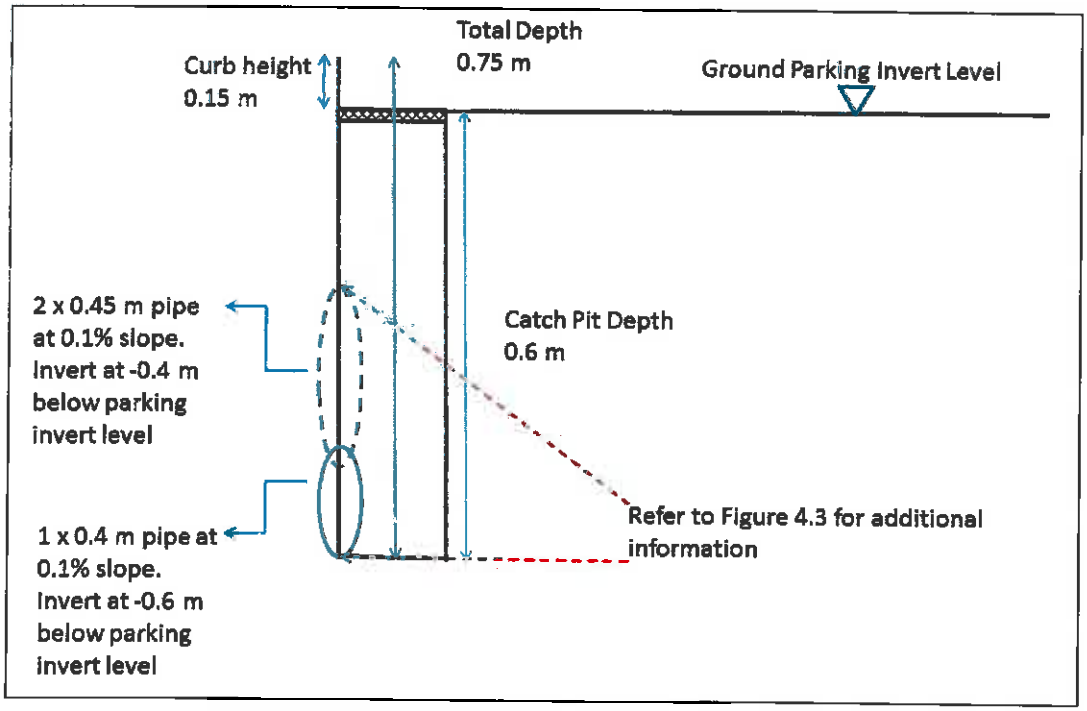


Figure 4-2 Conceptual Long Section Schematic of the Ground Level Catch Pit and the Stormwater Diversion Pipes.

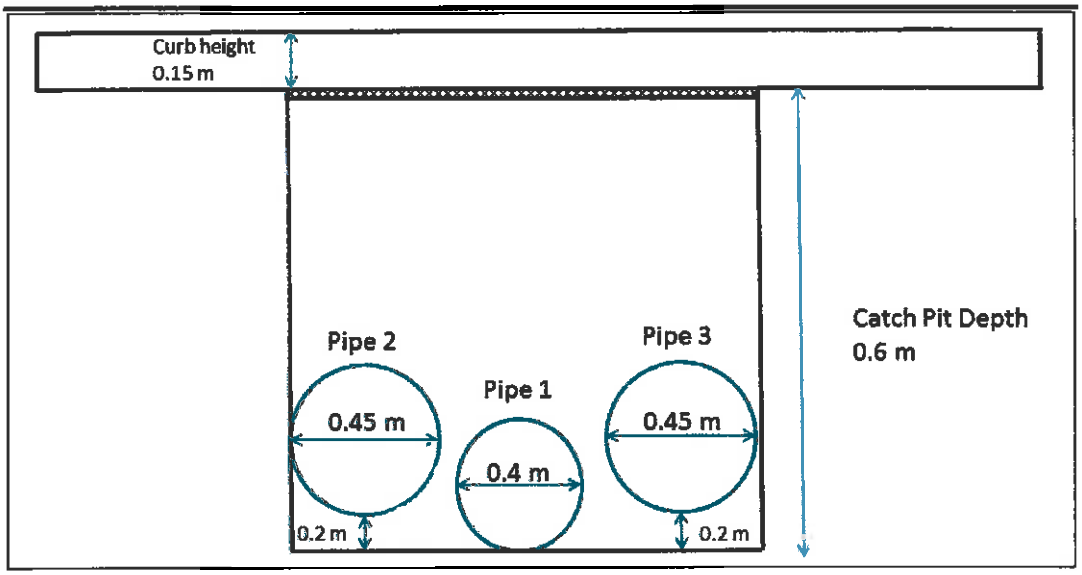


Figure 4-3 Conceptual Cross Section Schematic of the Catch Pit and the Stormwater diversion Pipes.

The final discharges of the individual pipes at a freeboard depth of 0.7 m are shown in **Table 4-3**. In order to prevent the flooding of the basement parking lot during the lower magnitude design flood events (i.e. the 1:2 year design flood event), it is recommended that the two larger outlet pipes are situated at an elevation of 0.2 m above the invert of the catch pit as shown in the schematic (**Figure 4-3**). The stormwater diversion system is conceptually designed such that Pipe 1 is situated at the invert level of the ground floor level catch pit and will lead into a sump located in the basement parking lot, (described further in the following paragraph) and then out to the receiving environment. Pipe 1 would discharge water into the Foxhill Spruit River at a rate of 0.28 m^3/s (**Table 4-3**). This is less than the pre-development peak of 0.29 m^3/s ensuring flood neutrality. The discharge from Pipe 1 would then require a stored stormwater volume of 403 m^3 which is obtained from the ground level parking area with a depth of 0.15 m. This results in the balance (704 m^3) of the total required attenuation (1 107 m^3) being diverted to the basement parking lot resulting in a standing water depth of 0.09 m. It is recommended that the ground floor parking lot is sloped toward the catch pit location to allow for the sufficient diversion and attenuation of the 1:50 year design stormwaters. Furthermore, all storm water producing and diversion structures (i.e. trading areas and downpipes) at the ground floor level are to direct the runoff they produce to the SWMP infrastructure located on the ground floor parking area. A layout plan view of the conceptual SWMP of the ground level is shown in **Appendix A**.

Table 4-3 Outflow Discharge of the Stormwater Pipes

	Foxhill Spruit River	Basement Parking Lot	
Freeboard (m)	Pipe 1 Discharge (m^3/s)	Pipe 2 Discharge (m^3/s)	Pipe 3 Discharge (m^3/s)
0.7	0.28	0.21	0.21

The 704 m^3 of stormwater diverted to the basement parking lot would reach a height of approximately 0.09 m during the 1:50 year design flood event based on the surface area of the basement parking lot (8 521 m^2 as provided by the client). A plan view of the basement level parking component of the SWMP is shown in **Figure 4-4.** The inflow characteristics of the 1:50 year design flood diverted by Pipes 2 and 3 into the basement level parking are shown in **Table 4-4.** In order to discharge the volume of water diverted to the basement level parking, two outlet pipes (diameters of 0.3 m) situated at an elevation of 0.4 m below the invert of the basement level parking are required (**Figure 4-5**) which will be situated in an sump in the storage area.

As mentioned previously, the development site is located adjacent to the Foxhill Spruit River. The proximity of the site to the Foxhill Spruit River necessitates the need to retain the stormwater stored in the basement level parking lot during the period in which the flood water levels of the river are above the elevation of the stormwater outlet pipes that drain the basement level parking (i.e. for the 1:50 year design flood and higher). No provision was made for the lower return period design flood events. Due to the need to retain the stormwater during the afore-mentioned flood events, a non-return valve will need to be installed on the two 0.3 m diameter pipes to prevent outlet control of the stormwater system and the Foxhill Spruit River flood waters entering the basement level parking through a backwater effect (**Figure 4-5**). The non-return valves will allow water to be released from the basement level parking lot following the recession of the 1:50 year design flood event and any events longer than this. Further to the above requirements, it is recommended that overflow structures situated at elevations of 621.3 mAMSL and 622 mAMSL are installed in the sump as emergency intervention structures to allow stormwater to exit the basement parking lot in the event of storm durations exceeding the recommended attenuation period of 0.5 hours. The above mentioned heights of 621.3 mAMSL and 622 mAMSL mAMSL are to compensate for the levels of the 1:50 and 1:100 year flood water levels of the Foxhill Spruit River. This will be discussed further in **Section 4.2.**

The SWMP results (**Table 4-5**) indicate that two 0.3 m diameter pipes sloped to 0.1% will discharge stormwater to the receiving environment at a rate of 0.22 m^3/s. This is favourable

as it is less than the pre-development peak discharge of 0.29 m^3/s. As for the ground level parking, it is recommended that the basement level parking is sloped to the position of the basement level catch pit to allow for the sufficient diversion and attenuation of the 1:50 year design stormwaters. As mentioned, during the 1:50 year design flood event, the flood waters of the Foxhill Spruit River will rise above the level of Pipes 4 and 5, which serve to drain the basement parking lot. During this period, Pipe 1 will discharge water to the Foxhill Spruit River at a rate of 0.28 m^3/s as it has the required hydraulic head to discharge into the flooding river. The discharge rate of Pipe 1 will diminish and eventually stop as the 1:50 year flood waters the recede. Pipes 4 and 5 will discharge water at a combined rate of 0.22 m^3/s after the 1:50 year flood waters have receded, thus, the maximum discharge of stormwater to the receiving environment will not exceed 0.29 m^3/s at any time. A layout plan view of the conceptual SWMP of the basement level is shown in **Appendix B**. The layout plan includes extents of the 1:50 and the 1:100 year floodlines, the proposed retaining wall which will be discussed further in **Section 4.2.**

Table 4-4 Inflow characteristics of the Diverted 1:50 Year Design Flood Event into the Basement Level Parking

Inflow Volume (m^3)	Inflow Discharge (m^3/s)
704	0.42

Table 4-5 Basement Level Outflow Pipe Requirements and Outflow Discharge

Freeboard (m)	Pipe 4 Discharge (m^3/s)	Pipe 5 Discharge (m^3/s)	Total Pipe Discharge (m^3/s)
0.4	0.11	0.11	0.22

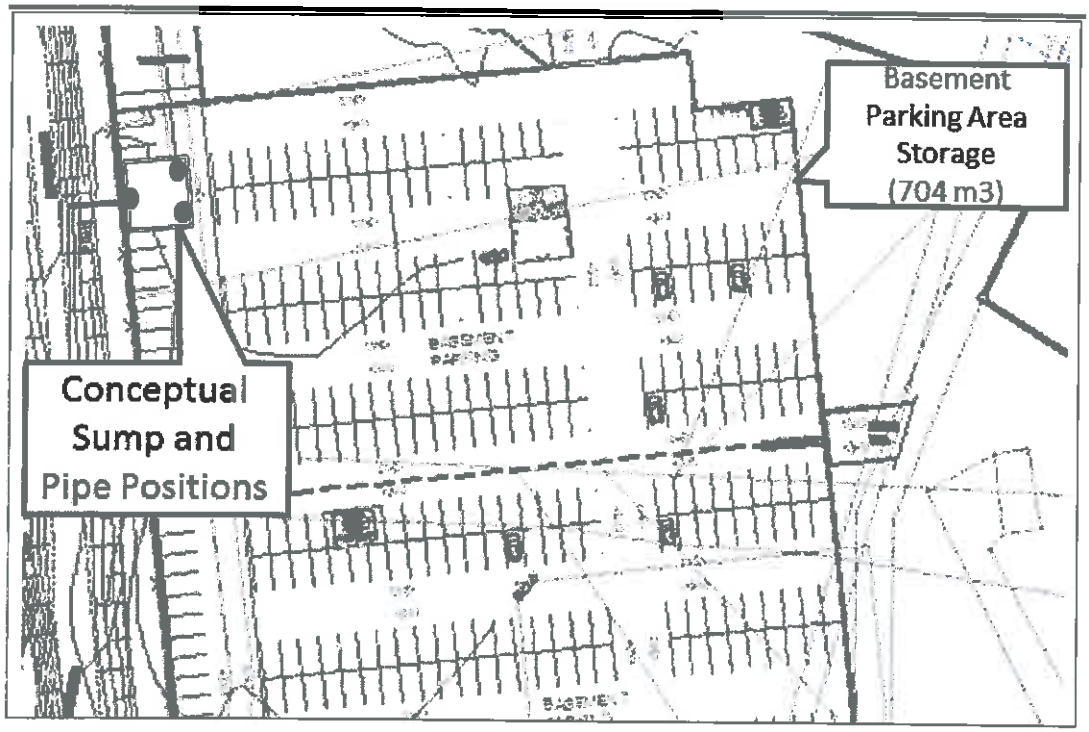


Figure 4-4 Conceptual Plan View of the Basement Level SWMP Infrastructure

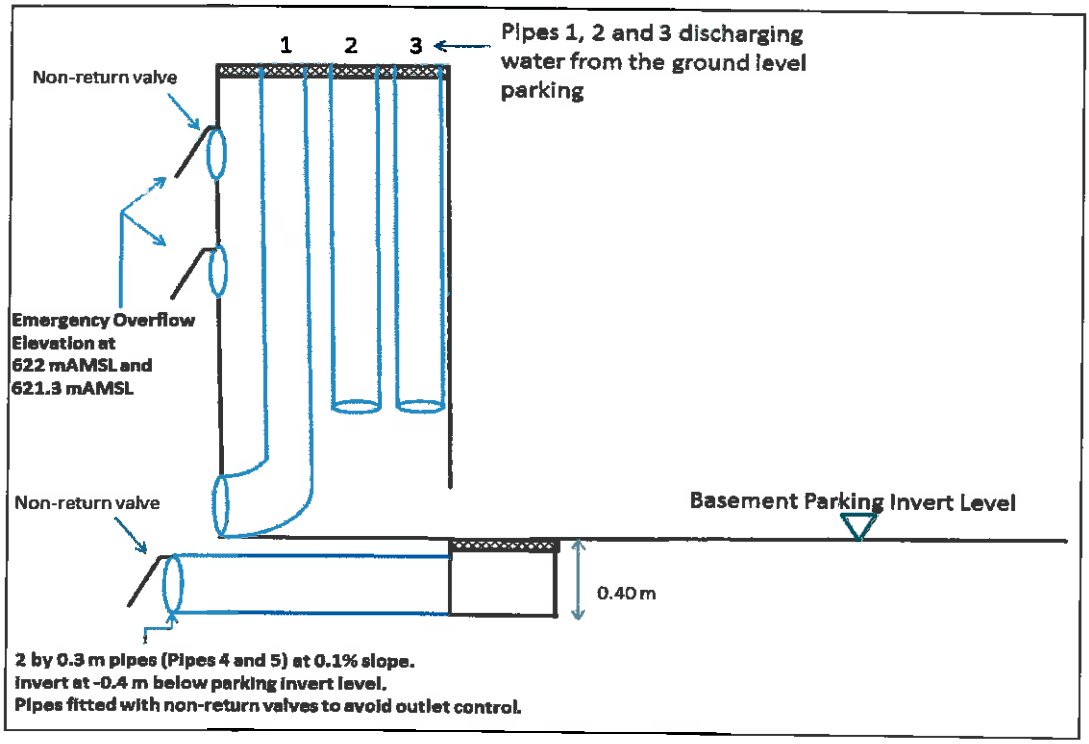


Figure 4-5 Conceptual Long Section Schematic of the Basement Level Sump, Catch Pit and Stormwater Diversion Pipes.

4.2 Floodline Delineations

The peak discharge values determined for the 1:50 and 1:100 year return periods for the Foxhill Spruit catchment at the proposed development are shown in **Table 4-6.**

Table 4-6 Foxhill Spruit Catchment Design Flood Results of the Proposed Woodburn Development Site

Peak Discharge	Return Period (years)	
	1:50	1:100
Q_p (m^3/s)	113.4	142.0

The results from the 1:50 and 1:100 year floodline analyses are shown in **Figure 4-6** and **Figure 4-7** respectively (the 1:50 and 1:100 year floodlines are presented separately in **Appendices C** and **D** respectively). The blue floodlines, which present the current site conditions, indicate that a significant portion of the Woodburn development site is inundated by both the 1:50 and 1:100 year design flood events. This is possibly due to the low slope gradient as indicated by the sparsely positioned contour lines (**Figure 3-1**). The low slope gradient allows for flood waters from the 1:50 and 1:100 year design flood events to encroach on and inundate the development site.

A flood prevention scenario was assessed during the hydraulic modelling component of the study. This introduced a retaining wall to prevent flood waters entering the development site. It was found that the 1:50 year flood reached a maximum height of approximately 1.13 m approximately 121 m downstream of the bridge, which is located upstream of the study site. The 1:100 year flood reached a maximum height of approximately 1.76 m. It is, therefore, proposed that a flood protection barrier (retaining wall) with a minimum height of at least 1.76 m from the ground level be constructed to prevent any possible damage of the site resulting from the 1:50 and 1:100 year design flood events. The length of the retaining wall parallel to the Foxhill Spruit River would need to be approximately 141 m long. The north and south ends of the retaining wall would need to span a distance of approximately 10 m. the afore-mentioned retaining wall height is based on the elevation of the modelled flood waters and does not take into account wind-run and wave action during the 1:50 and 1:100 year design flood events. It is recommended that these factors be taken into account by the site engineer during the final design of the flood protection barrier, thereby allowing for a freeboard component to the berm.

As mentioned, the level of the 1:100 year design flood waters reaches an elevation of approximately 620.07 mAMSL at a distance of approximately 121 m downstream of the Chief Albert Luthuli Road bridge. In order for the stormwater management infrastructure (**section 4.1**) to adequately discharge the 1:50 year design discharge, the level of the basement parking lot will need to be situated at an elevation of approximately 2.6 m above the elevation of the Foxhill Spruit River bank adjacent to the proposed development site to accommodate the required freeboard of 0.8 m and to ensure that the outlet pipe is not submerged by the 1:100 year design flood event water level.

In addition to the analyses, it was noted that no additional structures on the left side of the Foxhill Spruit River are impacted upon by the construction of a retaining wall around the areas of concern of the proposed Woodburn development. However, the bowling green and parking lot of the bowls club will be affected by the construction of the retaining wall under the 1:100 year flood conditions.

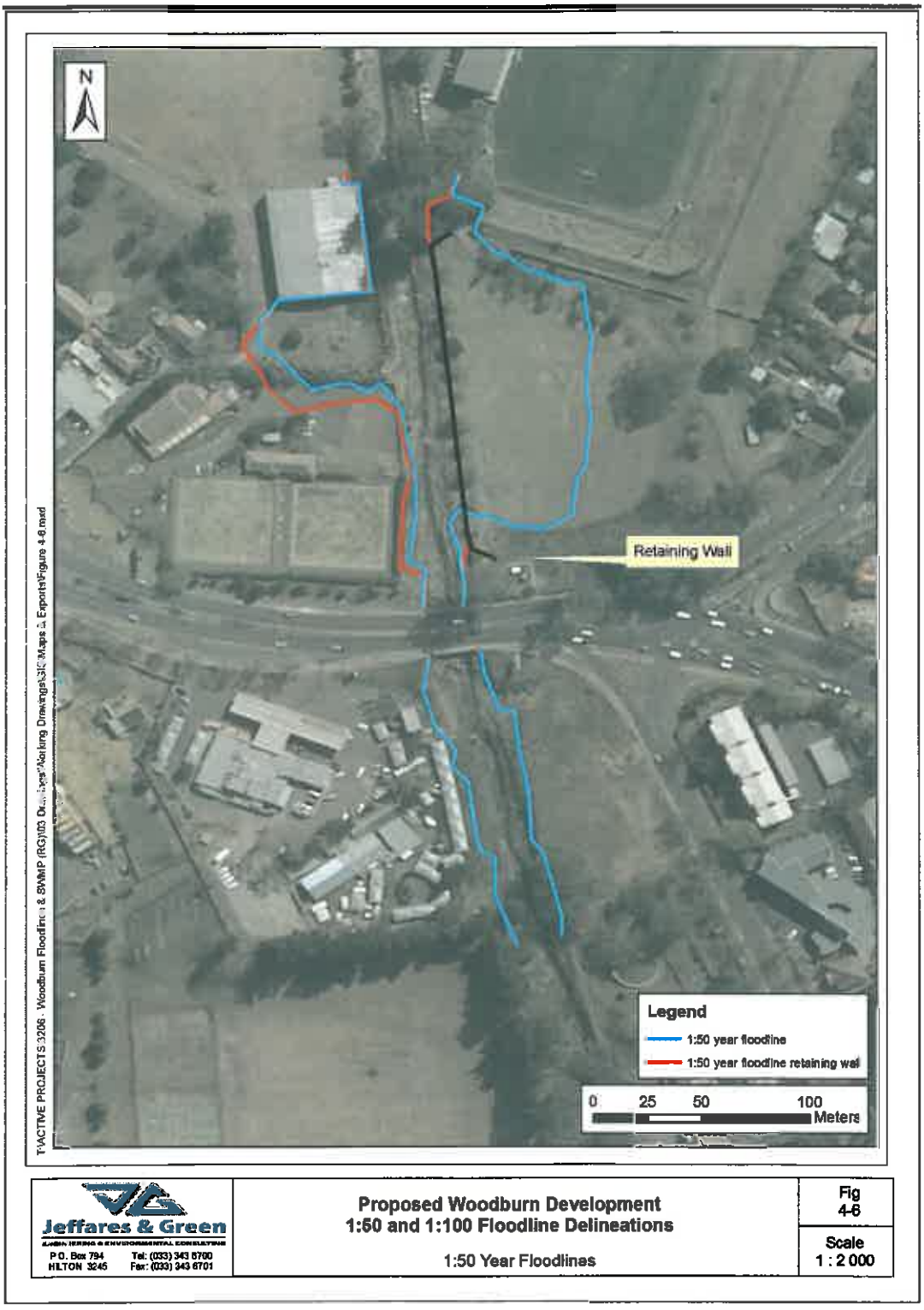


Figure 4-6 The 1:50 Year Floodlines for the Proposed Woodburn Development

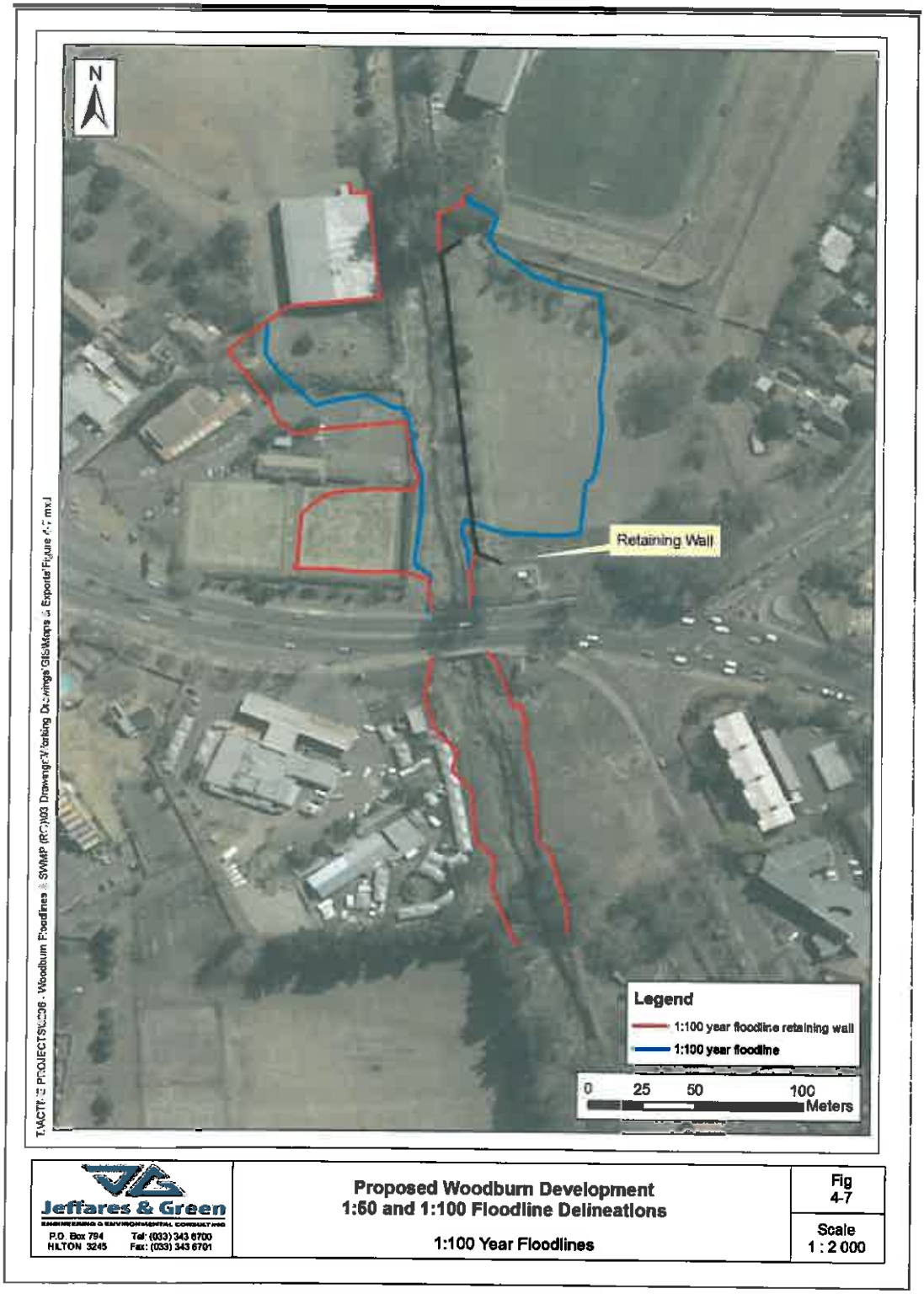


Figure 4-7 The 1:100 Year Floodlines for the Proposed Woodburn Development

5 CONCLUSIONS AND RECOMMENDATIONS

As part of the proposed Woodburn development project, assessments of a stormwater management plan (SWMP) and delineations of the 1:50 and 1:100 year floodlines were undertaken for the Foxhill Spruit River adjacent to the proposed development site. The first part of the investigation was to provide O & T Development with an indication of the stormflow volume generated by the proposed developments. The second part of the investigation was to provide O & T Development with an indication of the extents of the 1:50 and 1:100 year floodlines of the Foxhill Spruit River and to assess the areas of the property that may be vulnerable to inundation in the event of a 1:50 and 1:100 year floods.

The results from the assessment of the SWMP indicated that an additional volume of 1 107 m^3 is required to attenuate the impact of the development occurring at the study site. Based on the clients instruction to use the parking areas as attenuation storage facilities, it is proposed that an outlet with a 0.4 m diameter pipe (Pipe 1) situated at the invert level of the catch pit. Pipe 1 would need to be positioned 0.6 m below the invert level of the ground level parking lot. In addition, two pipes (Pipes 2 and 3) with a diameter of 0.45 m would need to be placed with their invert levels 0.4 m below the invert level of the ground floor parking level. Pipe 1 would serve as a diversion of a portion of the stormwater resulting from the 1:50 year design flood event to the Foxhill Spruit River at a discharge rate of 0.28 m^3/s. This was deemed acceptable as the discharge rate from Pipe 1 (0.28 m^3/s) would be less than the pre-development discharge rate of 0.29 m^3/s. Pipes 2 and 3 would serve to divert the balance of the stormwater to the basement at a combined rate of 0.42 m^3/s.

The release of the 1:50 year design flood waters would be accomplished by 2 pipes (Pipes 4 and 5) with a diameter of 0.3 m installed in a sump 0.4 m meters below the invert level of the basement parking lot. Pipes 4 and 5 would discharge the stormwater from the basement parking lot at a combined rate of 0.22 m^3/s. This is less than the pre-development peak of 0.29 m^3/s. As mentioned, the development is located adjacent to the Foxhill Spruit River. It is worth noting that the 1:50 and 1:100 year design flood levels result in the submergence of the basement level outlet structures. Thus, the stormwater diverted to the basement level parking lot will need to be retained until the recession of the 1:50 or the 1:100 year design flood waters. Pipes 4 and 5 would need to be fitted with non-return valves that would prevent the Foxhill Spruit River flood waters flowing into the basement parking lot. The discharge rate of Pipe 1 will diminish and eventually stop when the above-mentioned flood water levels have receded (due to the shorter time of concentration of the site in relation to the river) to

an elevation that allows for the release of stormwater stored in the basement parking lot. Thus, the total discharge of Pipes 1, 4 and 5 will not exceed the pre-development peak of 0.29 m^3/s. In addition to Pipes 4 and 5 serving as release structures from the basement level parking lot, it is recommended that emergency overflow structures fitted with non-return valves are installed in the sump containing Pipes 1 to 3. The elevations of the outlet structures should be 622 mAMSL and 621.3 mAMSL to prevent their submergence by the 1:100 and 1:50 year design flood levels, respectively. It is recommended that the ground and basement level SWMP infrastructure are installed in the north-west portion of their respective levels. The results of the hydraulic modelling exercise indicate that the flood waters are at the lowest elevation in line with the north-west portion of the basement level parking lot approximately 121 m below the Chief Albert Luthuli Road bridge upstream of the site., hence, providing storm water discharge earlier in the flood event. It should be noted that the ground level catch pit is in close proximity to the shopping area in the north-west portion of the development. It is therefore recommended that the catch pit, outlet pipes and mentis grating (or similar covering) are properly maintained and kept free of debris or other material which may cause as an obstruction to stormwater flow.

The results from the floodline assessment of the 1:50 and 1:100 year design floods indicate that a significant portion of the proposed development site will be inundated by the two afore-mentioned floods. It is proposed that a retaining wall with a minimum height of 1.76m metres be constructed to aid in the prevention of inundation by the 1:50 and 1:100 year design flood events (this excludes freeboard allowances for wind and wave action). Furthermore, no additional structures on the left side of the Foxhill Spruit River are impacted upon by the 1:50 and 1:100 year design floods with the intervention of a retaining wall at the proposed development site. However, the bowling green on the left side of the river will be inundated by the 1:100 year flood waters resulting from the intervention of a retaining wall. It must be noted that this may not occur, but due to the course level of the contour data on the adjacent river bank, it was not possible to confirm this.

The schematics of the plan, long and cross section views (**Figures 4-1** to **4-5**) of the SWMP are for conceptual purposes. The dimensions depicted in the above-mentioned schematics are not to scale. It is recommended that the design engineer takes cognisance of the required pipe, freeboard and slope requirements during the design of the SWMP infrastructure. However, the ultimate detailed design is at the engineer's discretion. Finally, erosion protection measures need to be included at all stormwater outlets discharging into the Foxhill Spruit River (e.g. flow splitters, reno mattresses and gabion baskets).

6 REFERENCES

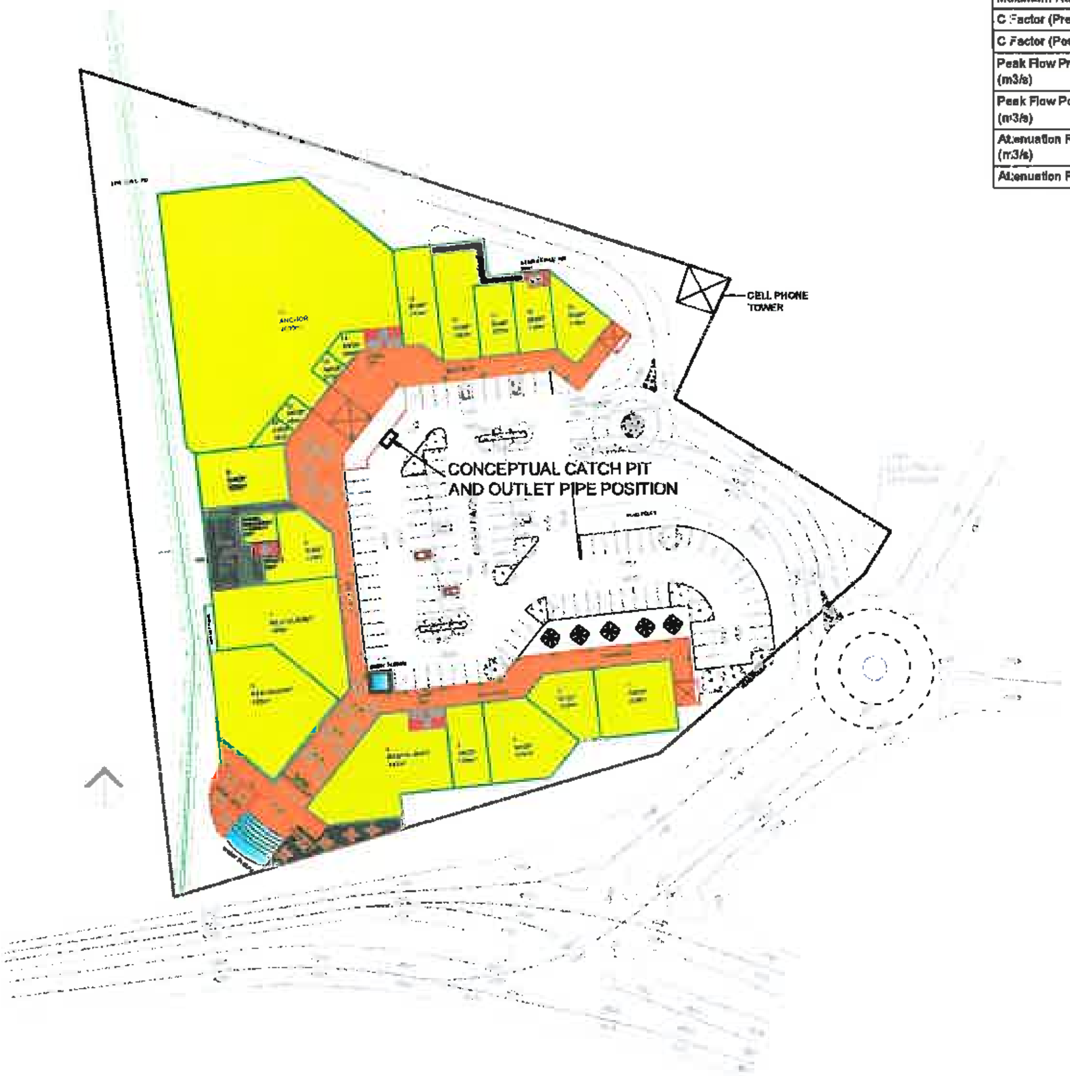
Henderson, F. M. 1966. Open Channel Flow, MacMillan Series in Civil Engineering.

Smithers, J.C. and Schulze, R.E. 2003. Design Rainfall and Flood Estimation in South Africa. Water Research Commission, Pretoria, RSA, WRC Report 1060/1/03. pp 156 plus CD-Rom.

APPENDIX A

Layout Plan of the Ground Level Conceptual Stormwater Management Plan

	Area	Return Period (years)					
	km2	2	5	10	20	50	100
Maximum Rainfall Intensity		51,5	75,0	94,7	117,3	165,0	188,5
C Factor (Pre-Development)		0,35	0,35	0,35	0,35	0,35	0,35
C Factor (Post-Development)		0,85	0,85	0,85	0,85	0,85	0,85
Peak Flow Pre-Development (m3/s)	0,0178	0,09	0,13	0,18	0,20	0,29	0,32
Peak Flow Post-Development (m3/s)	0,0178	0,22	0,32	0,40	0,49	0,70	0,78
Attenuation Requirement (m3/s)		0,13	0,19	0,23	0,29	0,41	0,46
Attenuation Requirement (m3)		342,00	501,00	633,00	784,00	1107,00	1247,00



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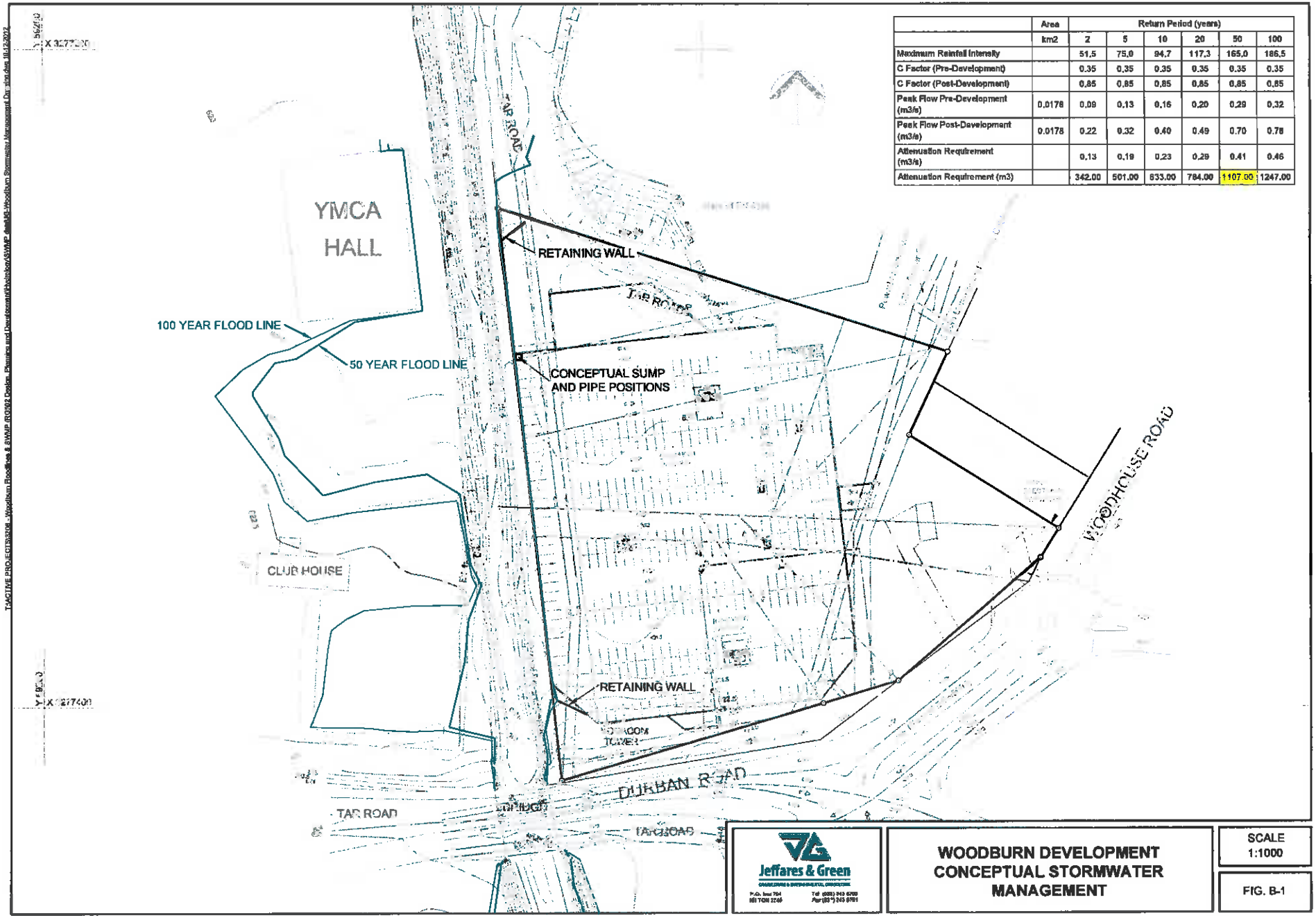
WOODBURN DEVELOPMENT CONCEPTUAL STORMWATER MANAGEMENT

SCALE 1:1000

FIG. A-1

APPENDIX B

Layout Plan of the Basement Level Conceptual Stormwater Management Plan, 1:50 and 1:100 Year Floodlines and the Proposed Retaining Wall



	Area	Return Period (years)					
	km2	2	5	10	20	50	100
Maximum Rainfall Intensity		51.5	75.0	94.7	117.3	165.0	186.5
C Factor (Pre-Development)		0.35	0.35	0.35	0.35	0.35	0.35
C Factor (Post-Development)		0.85	0.85	0.85	0.85	0.85	0.85
Peak Flow Pre-Development (m3/s)	0.0178	0.09	0.13	0.16	0.20	0.29	0.32
Peak Flow Post-Development (m3/s)	0.0178	0.22	0.32	0.40	0.49	0.70	0.78
Attenuation Requirement (m3/s)		0.13	0.19	0.23	0.29	0.41	0.46
Attenuation Requirement (m3)		342.00	501.00	633.00	784.00	1107.00	1247.00

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WOODBURN DEVELOPMENT
CONCEPTUAL STORMWATER MANAGEMENT

SCALE 1:1000

FIG. B-1

APPENDIX C

1:50 and 1:100 Year Floodlines of the Proposed Woodburn Development Site

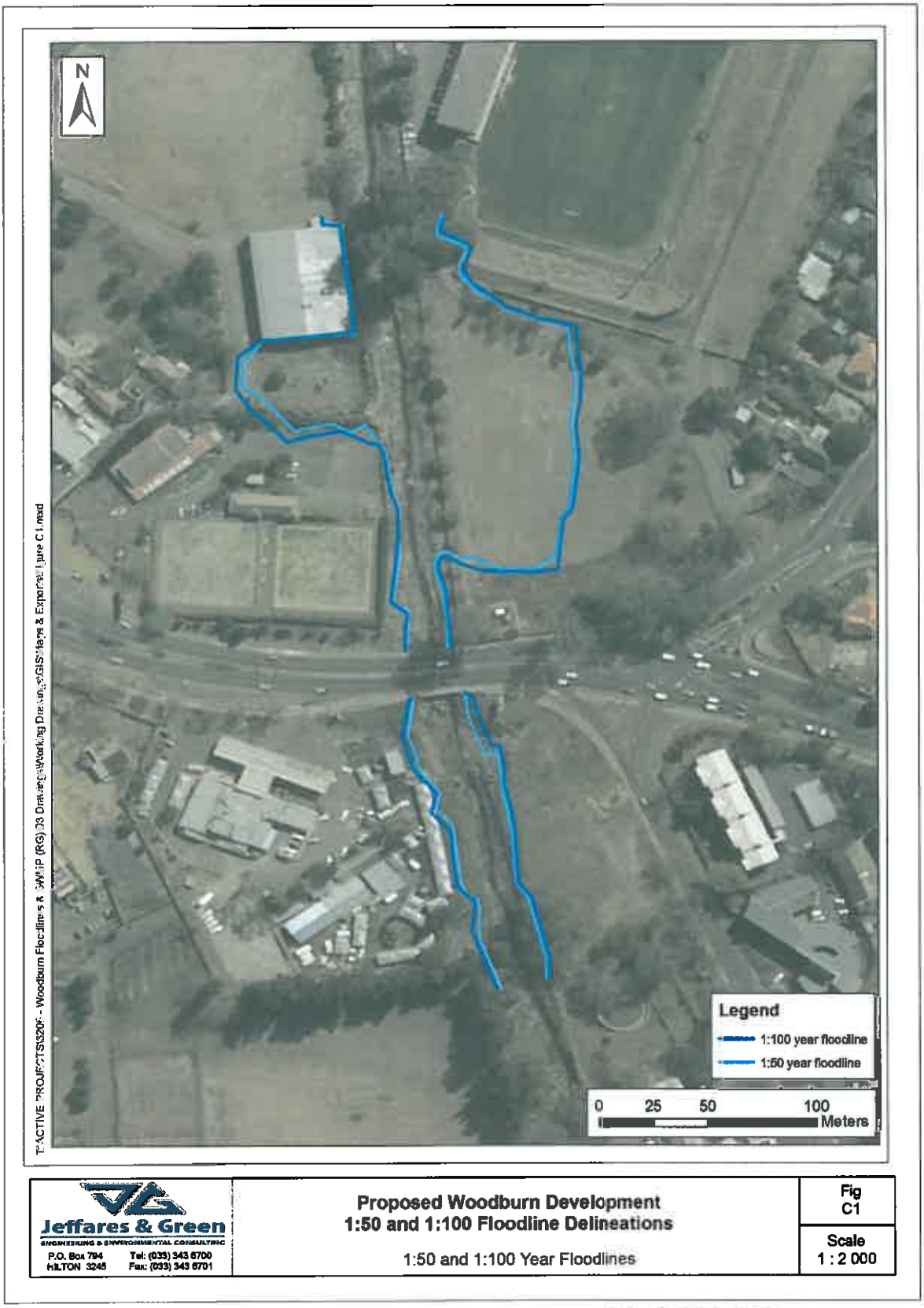

Figure C1 The 1:50 and 1:100 year Floodlines for the Proposed Woodburn Development

APPENDIX D

1:50 and 1:100 Year Floodlines of the Proposed Woodburn Development Site With the Proposed Retaining Wall Protection

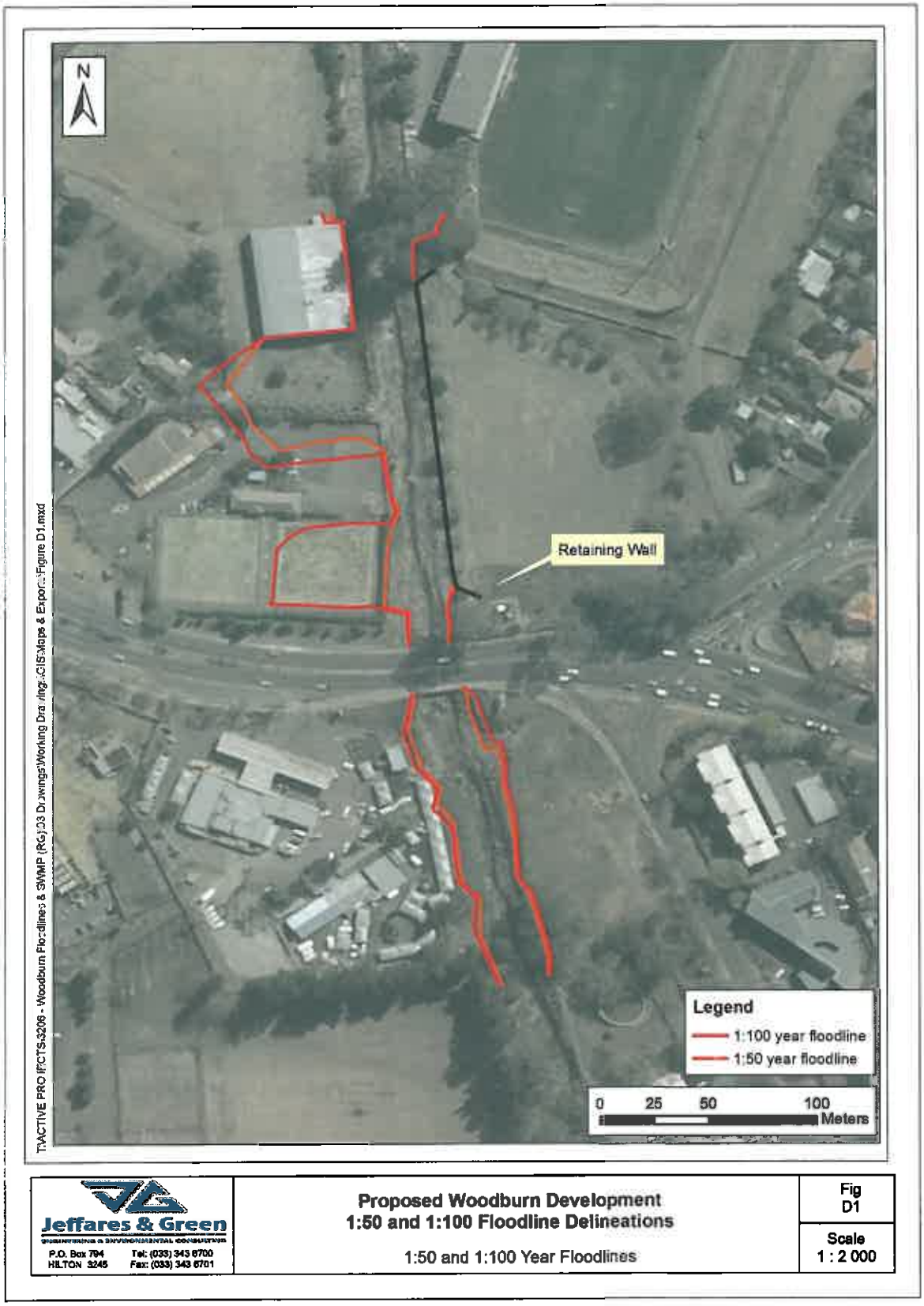

Figure D1 The 1:50 and 1:100 year floodlines and Retaining Wall for the Proposed Woodburn Development

Curriculum Vitae

Name:	Leonie Marais-Botes
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Contact Numbers:	Mobile: 082 576 6253 Landline: 012 335 5079
E-mail:	leoniembotes@gmail.com
Identity number:	7003040010081
Home language:	Afrikaans
Other language skills:	English
Health:	Excellent
Computer literate:	Yes

1. Education

1.1 Tertiary

Institution	Qualification	Year completed	Majors
University of Pretoria	BA	1991	Cultural History Archaeology Biblical Studies
University of Pretoria	BA (Hons)	1993	Cultural History
University of Pretoria	Post Grad. Diploma in Museum Science	1996	
Damelin Management School	Diploma in Basic Principles of Public Relations	1998	
University of Pretoria Management School	Management Development Programme	2004	
University of the Witwatersrand	Post Grad Dip (Heritage)	2009	

Short courses attended

Institution	Course
KwaZulu-Natal Provincial Museum Service	Conservation and Restoration
SAMADOC	Documentation of museum collections
KwaZulu-Natal Provincial Museum Service	Architectural Conservation
Southern Africa Museums Association	Collection and documentation of contemporary collections
OWL Education	Writing English for the Workplace
Cultural Heritage Research Centre, University of Canberra, Australia	Conservation of Traditional Buildings
South African Management Development Institute	Hearing procedures
Conservation Management Plan Study Tour, UK	Conservation Management Plan development and management
University of Pretoria	PFMA Course
International Quality and Productivity Centre	Environmental Impact Assessment Regulations

2. Work experience

Institution	Position	Responsibilities	Period	Experience
Independent Consultant			1 July 2012 -	• Section 38 (Heritage Impact Assessment) applications to Heritage Authorities • Section 34 applications to Heritage Authorities • General heritage management • Project Management • Financial Management • Public and Client Relations
Heritage Foundation	Senior Manager: Projects	South African Heritage Resources Agency (SAHRA) graves project Fund Generating projects	8 November 2010 to 31 July 2012	• Project Management • Budget and expenditure management • Personnel management • Contractor appointments and quality control of work

Council for Geoscience	Curator: Geoscience Museum	Supervision of the Geoscience Museum's education programme, displays, collections and exhibitions, supervise the day-to-day running of the museum, including marketing and advertisement of the Museum's activities, lobbying for grants, donations and external funding, financial and admin aspects of the museum and supervision of museum staff	1 November 2008 to 7 November 2010	• Understanding of museum and heritage sector • Strategic, analytical and financial skills • Organisational and planning skills • Negotiation and conflict resolution skills • Ability to work with a broad range of people at all levels • Ability to provide effective leadership and to inspire and motivate
PBAI (International) SA	Heritage practitioner/Environmental Practitioner	• Project manager: Environmental Impact Assessments • Heritage Impact Assessments	1 August 2007 to 31 October 2008	• Environmental legislation • Public participation • Heritage site management • Project Finance Management
National Department of Public Works	Assistant Director: Heritage Conservation	• General office administration • Project information and analysis in terms of heritage • Planning and co-	(01/01/1999►31July 2007)	• Office administration Writing of reports, official letters, internal memoranda, agendas, minutes, faxes, filing. • Project Management

		ordination of Conservation Management Plan (CMP) Projects • Planning and co-ordination of heritage training sessions, workshops and information sessions • Research • Internal and external public relations processes • Drafting of in-house Conservation Management Plans and Heritage Impact Assessments • Conservation management of Public Works items and sites • Loan agreements • Museums: 2nd phase development Nelson Mandela Museum, Mthatha, • Steering Committee new Woman's Museum, East London (DAC),		Developing concept briefs, briefing consultants, programme meetings, consultant accounts, 1st to final delivery • <u>Research</u> Background research for projects and enquiries • <u>National Heritage Legislation and international heritage principles</u> Extensive experience in running projects within the framework of the National Heritage Legislation (Act 25 of 1999) and international policy documents i.e. Venice Charter, Burra Charter • ICOM International Museum Standards knowledge and application

		• Site development Ncome Museum, Vryheid		

Institution	Position	Responsibilities	Period	Experience
				• Public Relations Skills Extensive internal and external client service experience, co-ordination of seminars, workshops and training sessions. Contributions to in-house journal. Presentations and talks. • Managerial Experience Knowledge of organisation's long-and-short term goals and plans; awareness of various roles and inter-departmental relationships. Relevant professional knowledge, thus an understanding of and proficiency in the methods, processes, procedures and techniques associated with heritage conservation.

				Analytical, problem-solving decision making skills. Social skills includes: interpersonal communication, delegation, negotiation, conflict resolution and dealing with authority and power. Stress control Proactive Creative
National Monuments Council (NMC)	Assistant-Manager: War Graves and Victims of Conflict Division	• Assist the manager with the caring and restoration of all war graves (1795 to July 1914) in South Africa • Research • Manage archives and library • Manage administration staff • Co-ordinator of Victims of the Liberation Struggle information • Function planner and co-ordinator	1 Dec 1997►31December 1998	• <u>Office Administration</u> Writing of reports, letters, internal memoranda, agendas, minutes and faxes. Data base use. • <u>Research</u> Background research for reports and enquiries. • <u>Managerial Experience</u> Manager for administration staff and research assistant

Institution	**Position**	**Responsibilities**	**Period**	**Experience**
National Monuments Council	Professional Officer: War Graves Division	• Assist the Manager with the caring and restoration of all war graves (1795►July 1914) • Research • Liaison •	1 April 1996►30November 1997	
Voortrekker Museum, Pietermaritzburg	Museum Human Scientist	• Collection Management • Conservation • Restoration • Research • Museum Education • Public Relations	1 September 1994►31 March 1996	
University of Pretoria		• Adaptation of the Aschenborn Collection to museum standards	April 1994	
National Cultural History Museum	Assistant	• Documentation of newly acquired museum objects	December 1992	
Lydenburg Museum	Assistant	• Documentation of museum collection	December 1991	

3. References

Me Helene Potgieter HP Architects Tel: 083 271 6778	Ms J.L. Beater PBA International (SA) Supervisor Tel: 084 404 1118
Dekha Katenga Director: Facilities Management Department of Correctional Services Private Bag X 136 PRETORIA 0001 0825640580	Mr Danie Barnardo Manager: Collections and Information Unit Council for Geoscience Private Bag X 112 PRETORIA 0001 Tel: (012) 841 1072
Michelle Bouwer Deputy Director: Key Account Management Department of Public Works Private Bag X 65 PRETORIA 0845803799	MapathaRamphele Deputy Director: Heritage Provincial Government Gauteng Dept of Sport, Recreation, Arts and Culture Tel: 011 355 2572 Cell: 083 554 1975
Mr Troy Phili South African Heritage Resources Agency (SAHRA) Burial Grounds and Graves Division 012 362 2535	Mr Rod Matcham Chief QS KZN Department of Works 0845884081/0823767000

4.1 Organisational involvement

- South African Society for Cultural History (SASCH)
- SA Museums Association (SAMA)

Council member

- SA Society for Cultural History (SASCH) (Treasurer and Vice-Chairperson)
- Gauteng Provincial Heritage Authority (PHRA-G) (member of the Built Environment and Permit Committee (2009-2012) (2012-2015), Convenor of the Heritage Impact Adjudication Committee(2009-2012))
- Voortrekker/Mzunduzi Museum, Pietermaritzburg

4.2 Committee involvement

- Secretary of the War Graves Committees of the National Monuments Council (1996►1998)
- Served as adviser on the planning committee for the community driven Victims of the Liberation Struggle Memorial in Thokoza
- Re-imaging of Government Buildings Committee, National Department of Public Works
- Served on the Heritage Sub-Committee for Constitution Hill and assisted the South African Heritage Resources Agency (SAHRA) – Northern Regional Office with developing the initial Conservation Management Plan for the said site
- Military Graves and Heritage Committee, Department of Defence
- Served as Heritage Advisor on the Presidential Inauguration Project Team of the National Department of Public Works (2004)

4.3 Contributions to in-house publication WORX NEWS (National Department of Public Works)

- September 2001, *It's a damp shame*
- October 2001, *"Some days are diamond..."*
- February/March 2002, *Fresh Air and Open Spaces*
- September/October 2003, *Heritage Conservation in Post-Apartheid South Africa*

- January 2006, *The Union Buildings*
- February/March 2006, *The history of Tuynhuis, Cape Town*
- April/May 2006, *History of King's House*
- May/June 2006, *Castle of Good Hope*
- July/Aug 2006, *The Value of Heritage Conservation*
- Sept/Oct, *Conservation of Heritage Buildings*
- Nov/Dec, *Did you know that heritage buildings and sites are protected by law?*
- March/April 2007, *SAND +STONE=SANDSTONE=DO NOT CLEAN*

4.4 Contributions to PBAI publications

- 2 articles for PBAI publications (international)

Electricity shortage in South Africa
Heritage Sites with special reference to the Rand Steam Laundries

4.5 Workshops and information sessions arranged, co-ordinated and facilitated

- September 1999: Management of Heritage Sites seminar (international speakers)
- September 2001: Conservation course focussing on Masonry (international course leader)
- National Department of Public Works Heritage Road Show (March 2002►December 2002)
- Documentation workshops for officials dealing with heritage items in presidential and ministerial residences (Durban and Cape Town Regional Offices)
- Guide training (literature and practical sessions) for Presidency staff at Union Buildings
- November 2006: Conservation of Heritage Buildings. Nederlandse Monumente Commissie
- June 2009: Department of Defence, training of officials in Heritage Conservation

5. Project involvement

Heritage Management

- Compile a Heritage Impact Assessment of Portion 5 of the Farm Spitskop 533JR, Bronkhorstspruit/Balmoral Area for Rock Environmental Consulting (Pty) Ltd;
- Compile a Heritage Statement Report for Doornkloof 391 JR, Irene for Stefan Frylinck & AssociatesTown and Regional Planning;
- Compile a Heritage Impact Assessment for 10 (a Portion of Portion 8) of the farm Bossemanskraal 538 JR for Rock Environmental Consulting (Pty) Ltd;
- Undertook archival research for the Heritage Assessment of Redevelopment of certain erven in Newtown, Johannesburg for PBAI (SA).
- Project Management of the Conservation Management Plan for the Bryntirion Estate, Pretoria for the National Department of Public Works.
- Project Management of the Conservation Plan for the Union Buildings Site, Pretoria for the National Department of Public Works.
- Compile Heritage Impact Assessment for Uitkyk/Hillside proposed new substation and associated 88kV lines, Peter Brett Associates International (PBAI)
- Compile Heritage Impact Assessment for proposed new Leslie Substation site and approx. 30 km 1 X 132kV power line from proposed new Leslie Substation to existing Wildebeest Substation, Mpumalanga Province, PBAI
- Determine Heritage Significance and compile Heritage Impact Assessment for broadening of Charles Street, Gauteng Province, Nemai Consulting
- 1st Phase Heritage Impact Assessment Diepsloot Gauteng Province, Nemai Consulting
- Heritage Impact Assessment for four priority parks, Soweto, Gauteng, Nemai Consulting
- Heritage Status Qua Report for Thaba Tshwane, Pretoria, Square Town Planning
- Heritage Impact Assessment for Rea Vaya Rapid Bus Transit System, section between Jan Smuts and Victoria Roads, Nemai Consulting
- Phase 1 Heritage Impact Assessment for Department of Water Affairs proposed Mokolo and Crocodile West Augmentation Project, Nemai Consulting
- Heritage Impact Assessment for proposed ESKOM Dwaalboom Switching Station, Nemai Consulting
- Heritage Impact Assessment for the proposed Formal Housing Development, Slovopark, Nemai Consulting
- Heritage Impact Assessment for National Department of Public Works Magistrate's Court development, Mamelodi, Henk Bakker Architect and Town Planner
- Heritage Impact Assessment for proposed Makuya cattle farm, Pafuri district, Limpopo, Chemc Environmental.
- Heritage Impact Assessment for Rethabiseng Housing development, Bronkhorstspruit, Nemai Consulting

- Heritage Impact Assessment for Danville/Elandspoort Phase 1 housing development, Pretoria, Nemai Consulting
- Heritage Impact Assessment for the consolidation of erven R/33, 1/33, 2/33, R/32, 1/32, Hatfield, Pretoria for Louis Cloete Incorporated
- Heritage Impact Assessment Bessie Ngwana Care Centre, Rustenburg, North West Province for Nemai Consulting
- Heritage Impact Assessment for the rehabilitation of Alpha Central and East Mine, Vryheid district, KwaZulu-Natal, Chemc Environmental
- Heritage Impact Assessment for consolidation of Erf R/22, 1/22, R23 and 415 Eloffsdal, Pretoria, Balido (Pty) Ltd
- Heritage Impact Assessment Erf 538 (111 Jan Smutsrylaan), Saxonwold, Johannesburg, Franz Jesche Architects
- Heritage Impact Assessment, "Gallows" C Max Prison, Pretoria, National Department of Public Works
- Heritage Impact Assessment Hammanskraal Housing Project, Chemc Environmental
- Heritage Impact Assessment for Weir 19, Kliprivier, Vereeniging, Nemai Consulting
- Heritage Impact Assessment proposed new Anderson Substation, Broederstroom, North West, Nemai Consulting
- Heritage Impact Assessment Dinaledi Anderson 400kV Transmission Powerline, North West Province, Nemai Consulting
- Heritage Impact Assessment Bloemendal/Delmas Rand Water deviation pipeline, Gauteng/Mpumalanga, Nemai Consulting
- Heritage Impact Assessment Barrage structure, Vereeniging, Gauteng for Nemai Consulting
- Heritage Impact Assessment, Marikana Housing Development, Nemai Consulting
- Rand Water Heritage Awareness Workshop, Nemai Consulting
- Heritage Impact Assessment for PROPOSED DEVELOPMENT OF A CHICKEN EGG PRODUCTION FACILITY ON PORTION 109, FARM ELANDSFONTEIN 412-JR, ROCK Environmental Consulting
- Heritage Impact Assessment for PROPOSED DEVELOPMENT OF A BROILER CHICKEN PRODUCTION FACILITY ON PORTION 120 OF THE FARM ELANDSFONTEIN 412-JR, ROCK Environmental Consulting
- Heritage Impact Assessment for the PROPOSED EXTENSION OF A CHICKEN REARING FACILITY OM PORTION 29 (A PORTION O F PORTION 4) OF THE FARM DANIELSRUST 518 JQ, Rock Environmental Consulting
- Heritage Impact Assessment, St Paulus School, NANOX Architects
- Heritage Impact Assessment, Erf 1570, George Avenue, Eastwood
- Zwartberg Chalet Development, Swartwater, Limpopo Province, ROCK Environmental Consulting
- Heritage Impact Assessment Kleinfontein Mixed land Use Development, Bokamoso Environmental and Landscape Architects

- Heritage Impact Assessment Re-Alignment of R50 for the Leeuwpan Mine and New Access Road, ROCK Environmental Consulting
- Addendum to and existing Heritage Impact Assessment for Berea Sports Grounds, Pretoria. SSI-DHV
- Heritage Impact Assessment for the proposed development of a piggery for Manalleen Boerdery cc.
- Heritage Impact Assessment for the proposed development of a filling station facility, Mankweng Limpopo Province. ROCK Environmental Consulting
- Heritage Impact Assessment for the proposed Sol B substation and associated powerlines
- Heritage Impact Assessment for TFR Asbestos Rehab, Nemai Consulting
- Heritage Impact Assessment for the proposed residential development erf 892 Wendywood X 2

- Project Manager for Conservation Management Plan, Bryntirion Presidential Estate, Pretoria for National Department of Public Works.
- Conservation Plans for various government buildings

Environmental Impact Assessments: Project Manager

- Basic Assessment for Uitkyk/Hillside Substation and associated line.
- Scoping and EIA for proposed new Leslie substation and 1 X 132kV power lines from proposed Leslie substation to Wildebeest substation.
- Scoping and EIA 6 X 132kV Macahdodorp Mpumalanga
- Scoping and EIA 1 X 132kV Simthabi project, Limpopo Province.
- Scoping and EIA Saber Gas pipeline project, Central District Botswana

Implementation of site Conservation Management Plans:

- Implement and monitor the Conservation Management Plan for the Bryntirion Estate on behalf of National Department of Public Works.

APPENDIX G

Functions

Agricultural Activities

The current land use of the site has led to severe degradation of soils. Furthermore, none of the surrounding properties are currently practising any agricultural or related activities.

Institutional Environment

The proposed development is in line with the planning frameworks and policies for the area. The proposed development site is also situated within the urban edge.

Alternative S2

N/A

Alternative S3

N/A

Alternative A1 (preferred alternative)

Already addressed above as part of S1 Alternative

Alternative A2

A2 Residential Development

The second activity alternative considered is the option of developing the entire study area as a residential development. This option was considered prior to the submission and approval of the DFA application and this option was eventually not regarded as the preferred option because 1) the study area has an ideal locality for a commercial/ business Retail development and it is very sought after, and 2) due to the high traffic volumes on the surrounding roads, the noise levels on and around the study area is very high and it is not ideal for a residential development. The acceptable noise levels for a residential area are an urban area is 55dBa.

The most significant impacts identified for the construction and operational phases are:

Construction Phase:

Negative Impacts:

Bio-Physical Environment:

Not significant, the site is already disturbed
-Possible siltation problems if construction phase storm water management is not implemented

Socio-Economical Environment:

- Waste management,
- Temporary disruption of services and accesses to surrounding properties,
- Noise pollution,
- Visual pollution,
- Safety and security problems,
- Dangerous conditions on roads,
- Dust pollution,
- Dangerous conditions on and around site (i.e. dangerous excavations)

Positive Impacts:

Bio-Physical Environment:

- Rehabilitation of disturbed areas and coverage of exposed areas;
- Implementation of an EMP that supplies some guidelines for development

Socio-Economical Environment:

- Creation of temporary jobs;
- Economical advantages to surrounding businesses (i.e. filling station, hardware stores, food outlets etc.).

Institutional Environment:

- Not significant

Operational Phase:

Negative Impacts:

Bio-Physical Environment:

- Implementation of indigenous urban landscaping

Socio-Economical Environment:

- Noise pollution (higher than the acceptable levels for a residential development);
- Visual pollution (if not well planned and managed);
- Increased traffic (lighter vehicle and heavy vehicle traffic)

Institutional Environment:

- Not significant. A commercial/ retail development has already been approved on the study area. A residential development will not be in line with the approved land-use rights.

Positive Impacts:

Bio-Physical Environment:

- Implementation of an EMP that supplies some guidelines for development

Socio-Economical Environment:

- Creation of permanent and temporary jobs;
- Availability of upmarket industrial facilities in the area;
- Increase/ decrease of surrounding property values;
- Installation of bulk services and infrastructure for the larger area. Will make it possible for smaller developments to connect to municipal services and to get off the ground;
- Upgrading of services and surrounding roads;
- Rates and taxes payable to the local authority

Institutional Environment

- A commercial/ retail development has already been approved on the study area. A residential development will not be in line with the approved land-use rights.

Alternative A3

Not applicable

No-go alternative (compulsory)

The "No-Go" alternative

The study area currently appears neglected and the rugby club made the land available to developers for development purposes. The rugby club does not have the funds to maintain the study area and it is currently a safety risk and a maintenance burden.

When looking at the current overgrown and neglected state of the riparian area of the Foxhill spruit which borders the study area, it is clear that the authorities also lack the capacity to maintain and police open spaces in the area. The management of the study area as an open space area (this is currently the case) is therefore not an option.

From a social point of view, the undeveloped and neglected site can become a security risk. Sites that have been earmarked for development and that already have development rights in place, can easily become neglected if it takes long to get the development off the ground. The fact that a dead person was found on the study area during one of the specialist's site visits proofs the current security risks.

In the case of the specific study area, the "no-go" area is not regarded as a viable alternative.

8. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner).

YES	NO
X	

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorization that may be granted by the competent authority in respect of the application:

- Mitigation measures, in the form of the EMP ***(Appendix F)***, must be implemented during the construction and operational phases;
- The EMP and ROD must be implemented by the contractor and/or any sub-contractors;
- An onsite ECO (Environmental Control Officer) must be appointed to monitor the implementation of the EMP;
- Environmental monitoring must be conducted as specified in the EMP;
- External environmental monitoring must be conducted to ensure overall compliance

with legislative requirements and the EMP,
- A Stormwater Management Plan must be compiled by the appointed engineer and implemented during construction and operational phases.
- The Site Development Plan (SDP) and Landscape development Plan (LDP) should be approved by the Local Authority,
- No snaring or hunting of animals during the construction phase,
- If during construction any new evidence of archaeological sites or artefacts, paleontological fossils, graves or other heritage resources are found, the operations must be stopped and a qualified archaeologist or SAHRA must be contacted immediately for an assessment of the find,
- After clearing of the vegetation the site should be protected against erosion,
- Proper compaction must be executed to prevent settlements from taking place,
- Foundation recommendations made by the engineer must be adhered to,
- The safety and security of the people in the surrounding area are important and must be taken in to consideration during the construction phase,
- Specific roads must be allocated for the use by construction vehicles and photos must be taken prior to construction in order to determine if any damage has been done. Upgrading of the roads is a prerequisite (if so required according to the traffic engineer),
- The developer/engineers must make sure that sufficient services are available,
- Local people must be employed,
- All waste must be disposed of at a registered waste disposal site,
- The applicant must apply for the necessary section 21 Water Use Licenses and supply proof of such application to KZNDAE, and
- Rehabilitation must be done correctly and to the satisfaction of the ECO

SECTION G: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Comments and responses report

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Other information