

CHAPTER III.

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# 03 context analyses

## 3.1 A Vision for the Apies River

Where the river cuts through the mountain.....the Apies

It is one of the region's most viable resources as a working, natural and recreational landscape. A greenway/blueway master plan initiates a real process for maintaining the vital connections to the river for present and future generations. It is an opportunity to protect the river's functions and processes. This will increase the economic and aesthetical value of this area, and ensure that the green space be preserved for future users.

This last stretch of the Apies river is worthy of a plan that defines future landscape treatments by responding to the character of the river and incorporating the spatial development plan of the area. This dissertation is intended to guide future land use in the Apies River bottom to preserve and enhance quality of life around the river. The future of the Wonderboom/Apies River area depends upon the timely establishment of preservation policies and green space connections, both of which can be achieved through the establishment of the Apies River greenway.

This chapter will cover the contextual analyses of the site and surrounding area.



fig 3.1: Apies River logo (Holm)  
15

## Institutional context

### 3.1 Integrated Development Plans (IDP)

In 1997 Integrated Development Plans (IDP) were compiled for the whole of Pretoria and for each of the 9 planning zones. The Apies River intersects Zones 1, 2, 8 and 9, with the following of relevance in these plans:

IDP Zone 1 describes the potential of Bon Accord Dam as a recreational asset and states the importance of eco-tourism activities, nature trails and the preservation of green belts. A strategic development area is identified as an extension of Wonder Waters shopping node, with guidelines to conserve the Apies River in the proposed development defined as a high priority. A techno/office/hotel park is identified as a possibility along the Apies River, with an intermodal transfer node being proposed at the intersection of Rachel De Beer Street and Paul Kruger Street extension.

IDP Zone 2 identifies flooding of the Apies River and underutilization of open spaces or unprotected natural areas as problems. Legal protection of the River and utilization of its potential as an eco-tourism asset is proposed. A recreational area at the Wonderboompoort is suggested. Cycle routes, hiking trails and a possible lake are mentioned. (Holm, P5)

### 3.2 National Water Acts

The National Water Act (Act 36 of 1998) states as follows: *"For the purpose of ensuring that all persons who might be affected have access to information regarding potential flood hazards, no person may establish a township unless the layout plan shows ... lines indicating the maximum level likely to be reached by flood waters on average once in every 100 years."*

The following is not clear in the Act:

- Whether the Act is applicable only to new township applications. Apparently, existing townships will not be subject to floodline revisions.

- Whether the 100 year floodline is only for information purposes or as a building restriction.
- What type of development will be allowed below the 100 year floodline, if any.
- No reference is made of floodlines for undeveloped land.

In the Metro-wide IDP of 1997, development is restricted between a 50 meter corridor on both sides next to the 50 year floodline adjacent to streams and rivers. This was defined in anticipation of the requirements of the National Water Act. The restriction is proposed to be revised in the light of the above mentioned uncertainties. (Holm, P5)

### 3.4 Greenway Master plan

The Apies River Greenway Master Plan is intended as the open space component of a larger urban development plan (Rainbow Junction). It will guide future land use along the Apies River in this specific area by encouraging agriculture preservation, water quality improvement, wildlife habitat protection and the creation of a recreation amenity for all residents and visitors to this area.

The vision for this plan incorporates two distinct elements, connection and preservation.

#### Connection

- Surrounding communities
- Landscape to river
- Nature to City
- People to nature
- Nature to nature

#### Preservation

- Quality of life
- Plant and animal habitat
- River function and processes
- Agricultural lands
- Historic sites

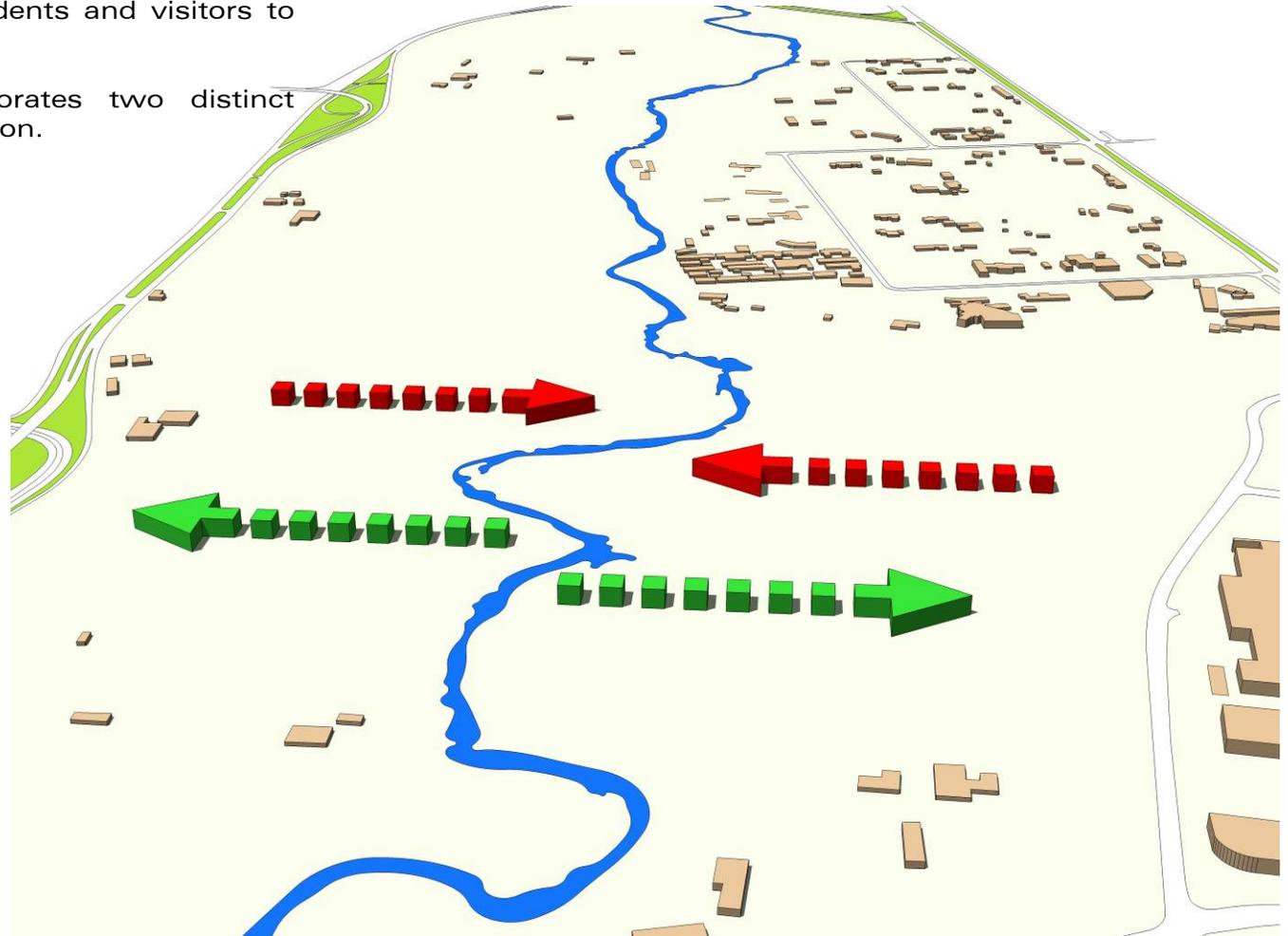


fig 3.2: connection

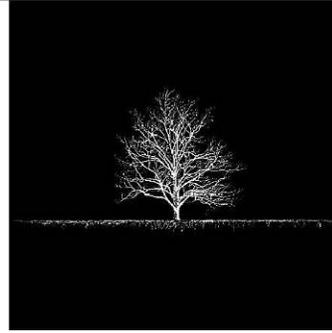
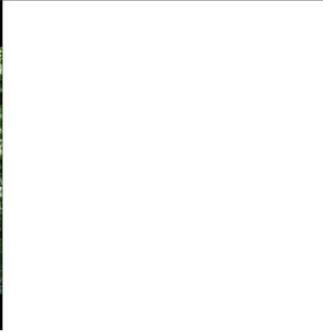
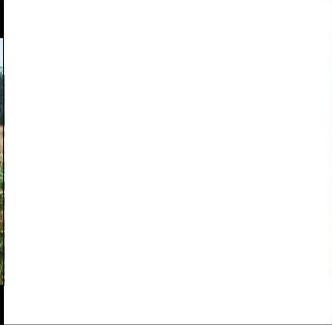
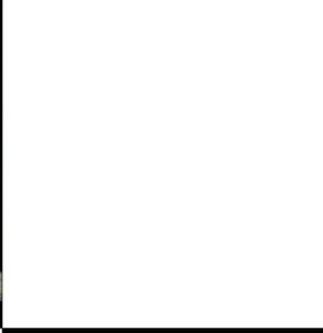
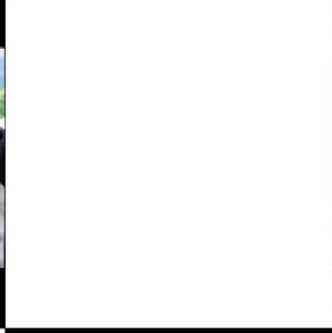
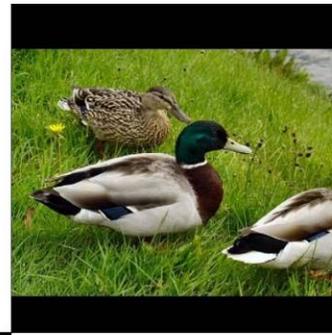


fig 3.3: preservation

### 3.5 Apies River Urban Analyses

The site and context analyses will be on the Wonderboom poort and the Northern Apies River edge as indicated by fig.3.4. Each aspect of the analyses will take a quick look at the greater Apies River before listing the main problems or features that can have an effect on the urban open space framework.

The information used in this analysis was obtained from the Apies River Design Framework. (This document was collaboration between Holm Jordaan & Partners Architects and Urban Designers, Pretoria City Council and Action Apies River Working Committee) Fig3.5 shows this site in its immediate environment.

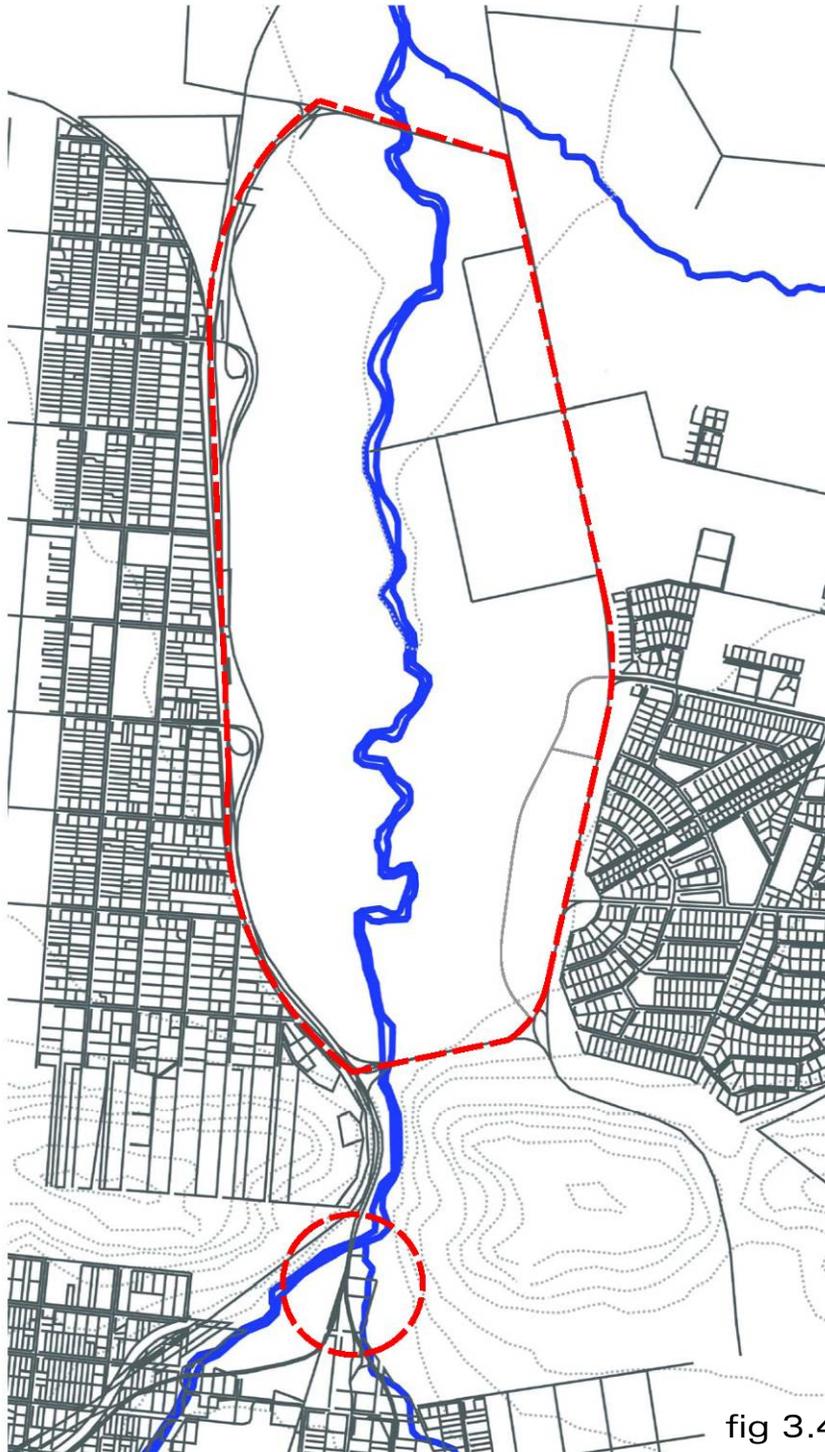


fig 3.4: the Site

In fig 3.6 it is clear how the site flattens out to the north. This part of the river can be very dangerous in storm conditions. The reason for this is the Apies River is pushed through the Wonderboom poort (fig 3.5) together with other smaller streams and storm water. The river takes up an enormous amount of storm water from the CBD and surrounding areas. This area serves as the floodplain for the river in big storms. It is thus important to protect existing and future developments from the dangers of the river.

The issue of the floodplains will be addressed in the next chapter under master plan development.

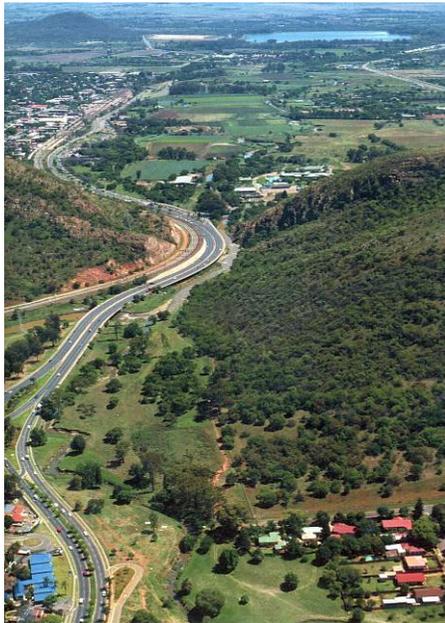
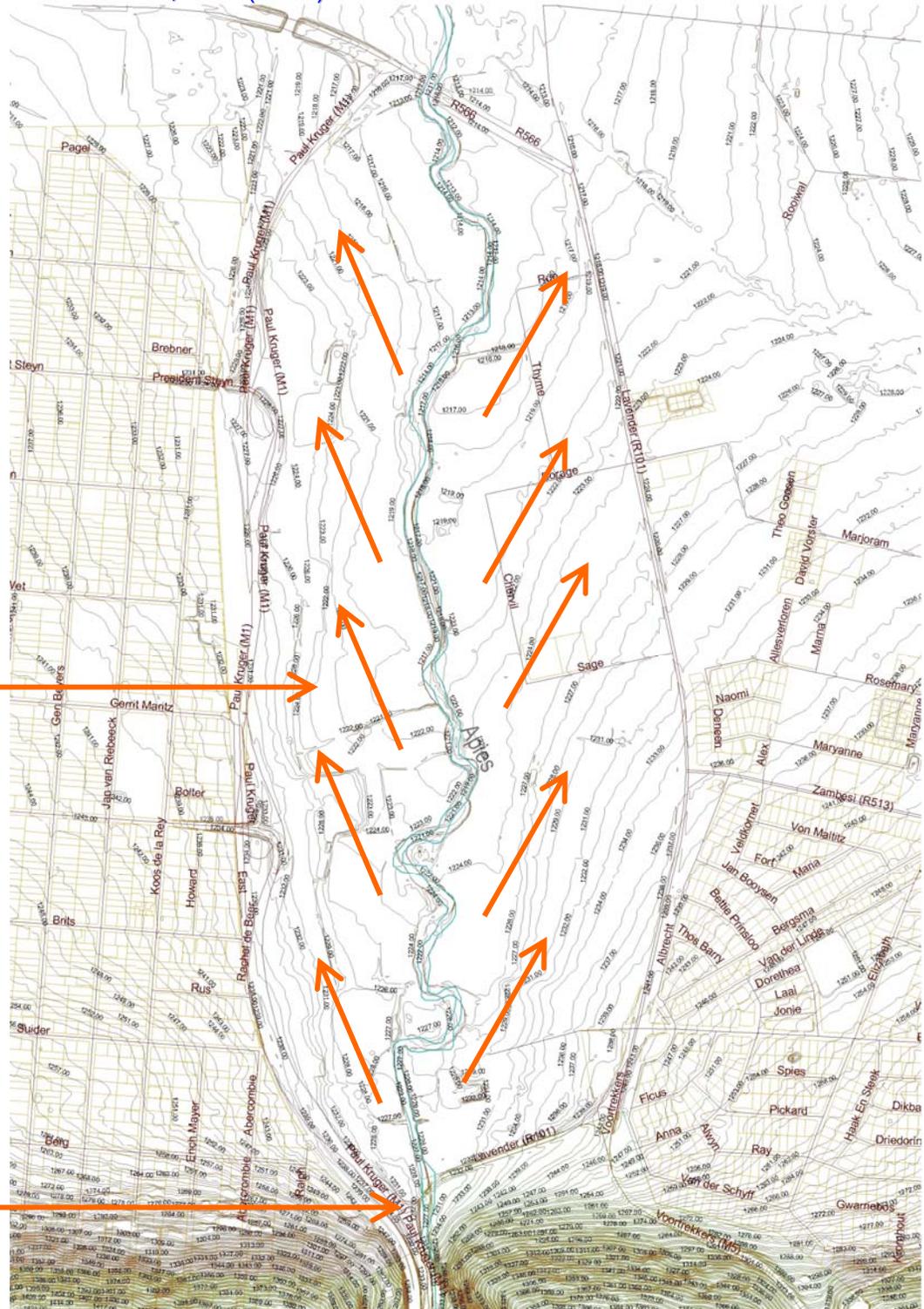


fig 3.5: View to the poort (Nel)

Floodplains

Wonderboom Poort

fig 3.6: site contours



### 3.5.1 Urban Form

#### 3.5.1.1 Perceptual qualities

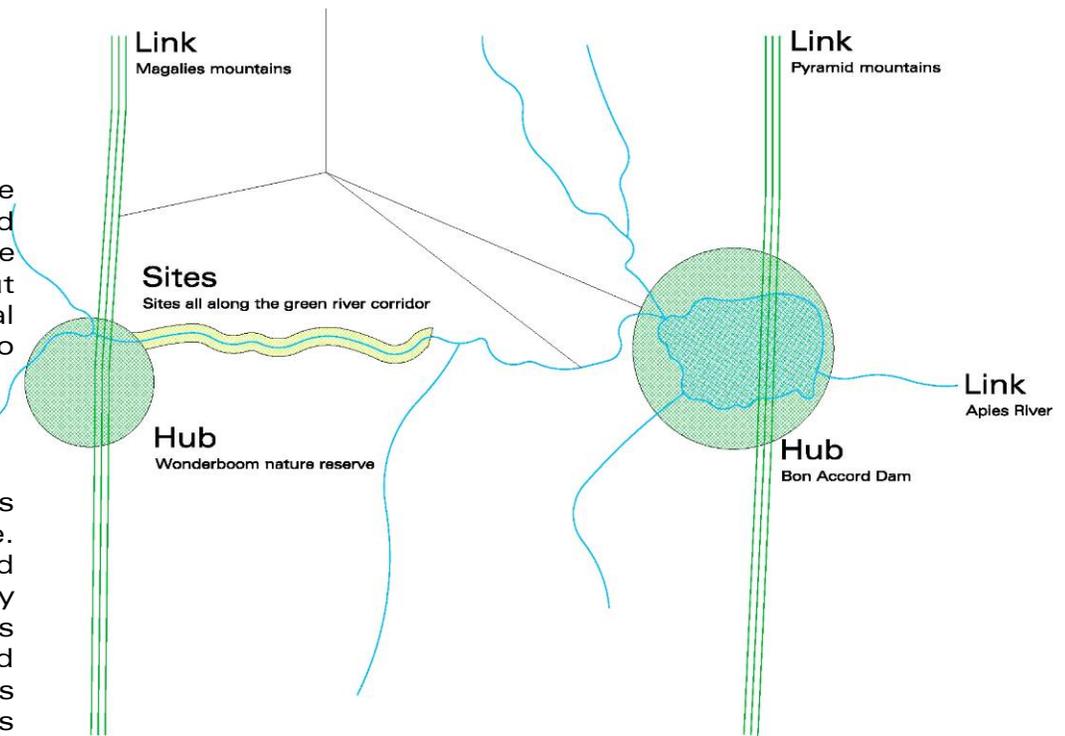
The almost 20 kilometer long Apies River is not legible as a linear line or string of activities. It is experienced through flash images at crossings or through gaps in the urban fabric. The river passes through the city without public knowledge and with no focal points for serial observation. Placemaking elements are lacking, with no unique sense of place.

#### 3.5.1.2 Open Space Network

The Apies River links important natural elements such as nature areas, streams and ridges on a citywide scale. Accessibility on a smaller scale is almost impossible and where it is possible, it is either unsafe or visually unpleasant. In some instances hard and ugly edges exist, with backyard walls facing onto the river and forming the edges of the space. In other areas, there is almost no enclosure of space. Surfaces are not always viable for usage, with almost no attractive elements in the space. The river does not foster urban life. A pedestrian culture does not exist and almost no activities occur along the river during the day or the night. Poor lighting at night contributes to the “deadness” of the river.

#### 3.5.1.3 Morphology

There are a few large open spaces along the river (e.g. Agricultural land, Unused open areas), but they are not accessible from the river and often not developed to be usable public spaces. On a detailed scale, small or intimate open spaces at street corners occur, but it should be formalised to form an integral part of a hierarchy of public spaces. Building typologies do not contribute to a feeling of identity and enclosure.



**Links** are the heart of the greenway system. They are linear connections for people and nature.

**Hubs** are the anchors of the system. They provide a base or distinction for people and nature.

**Sites** are smaller features than hubs which serve as point of interest, origins or destinations.

fig 3.7: Anatomy of the Greenway

### 3.5.1.4 WONDERBOOM POORT - URBAN FORM

#### Perceptual qualities

- No legibility due to high order roads lifted from level of river
- Unique image enhanced by waterfall
- Poort gateway to city with natural sense of place, waterfall focal point

#### Open space network

- Not directly accessible
- Edges defined by ridges
- Mainly road surface
- Infrastructure elements obvious elements in space

#### Morphology

- Roads dominate
- No river interface

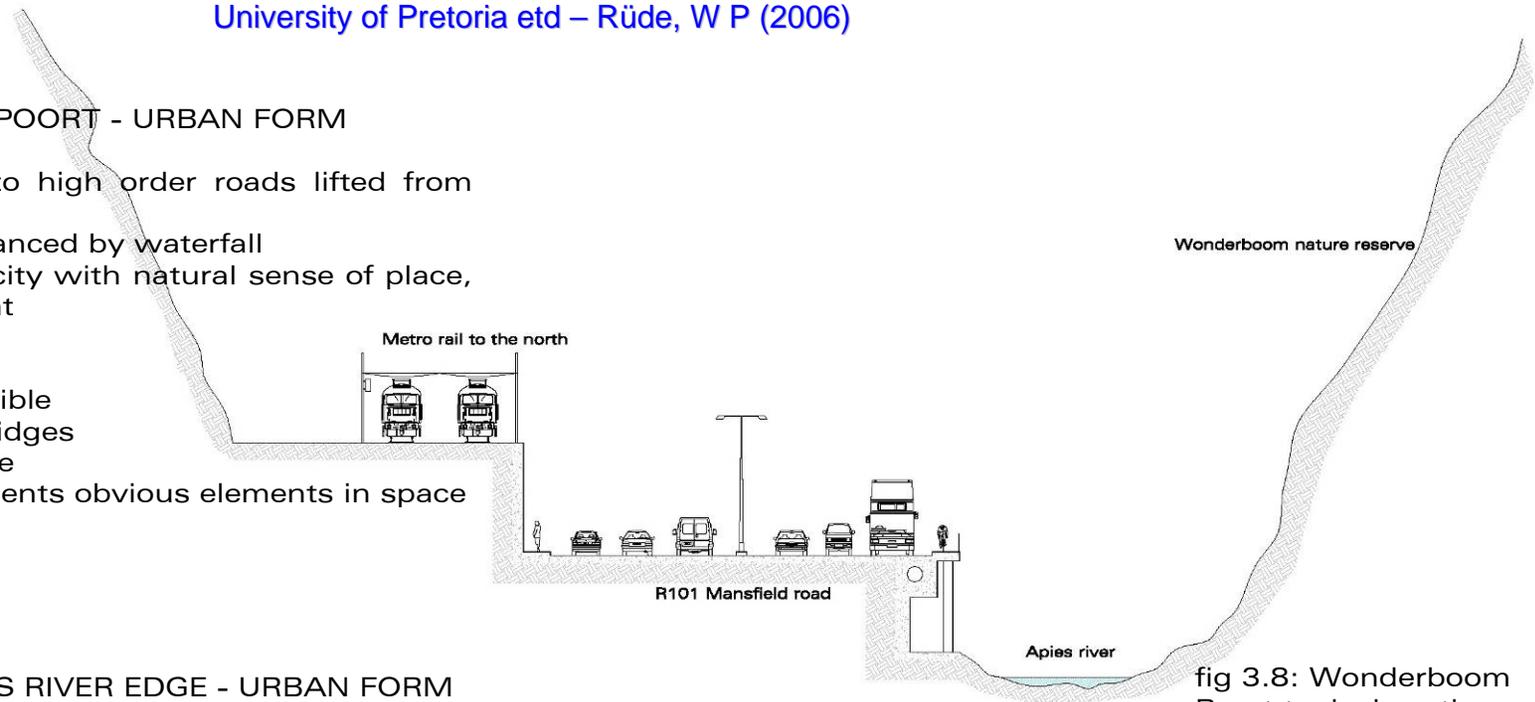


fig 3.8: Wonderboom Poort typical section

### 3.5.1.5 NORTHERN APIES RIVER EDGE - URBAN FORM

#### Perceptual qualities

- Legible as part of cultivated area, highly visible at bridge crossings
- Natural image supported by agricultural activities
- Cut in mountain defines gateway to city

#### Open space network

- Not directly accessible due to private property, no direct roads
- Mountain defines southern edge of space
- Agricultural to natural surfaces
- Overhead power lines dominating elements in space
- Mainly agricultural activities, mining and illegal development to east

#### Morphology

- Wide flood plain defined by roads on both sides
- The few residential structures along contributes to weak river interface

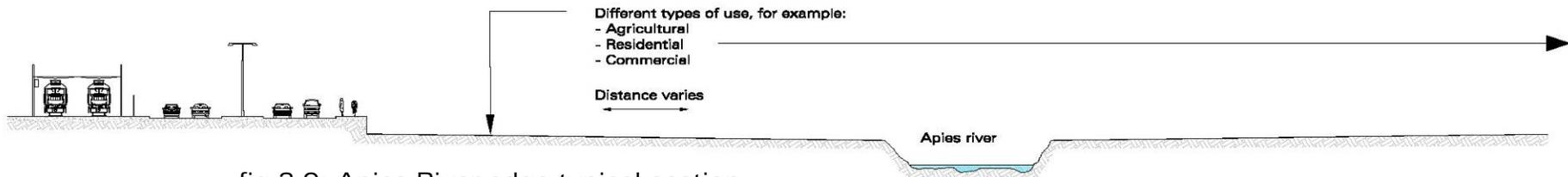


fig 3.9: Apies River edge typical section

### 3.5.2 Land Use

#### 3.5.2.1 Land Ownership

- The bulk of land adjacent to the Apies River is privately owned.
- Parcels of land are owned by the national or provincial government and are managed by the Department of Public Works.

#### 3.5.2.2 Existing zoning

Existing zoning is reflected to a large extent in existing land uses, with illegal uses being a minimum.

#### 3.5.2.3 Existing land uses

More than 70% of the land adjacent to the entire river (measured in distance fronting directly onto the river) consists of the following four land use categories:

- Farming activities (21%);
  - Single and low rise residential (18%);
  - Government and institutional uses (17%); and
  - Regional open space (16,5%).
- (Holm, P7)

The part north of the Magaliesberg has mainly agricultural activities along the river.



fig 3.10: Land Use along river

#### 3.5.2.4 WONDERBOOM POORT - LAND USE

##### East

- Green open space used for picnics, informal churches with natural ridges of Magaliesberg Mountain Range (protected by law) further to the east

##### West

- Major road and railway line bordered by natural ridges of Magaliesberg Mountain Range

#### 3.5.2.5 NORTHERN APIES RIVER EDGE - LAND USE

##### Southern portion

- Wonderwaters recreation and retail node to the east (currently being demolished for new lifestyle centre)
- Agriculture to the west

##### Northern portion

- Mainly agricultural uses with a small residential component to the east
- Agriculture to the west



fig 3.9: Unused Green open space

### 3.5.3 Urban Nature Conservation

#### 3.5.3.1 Natural physical characteristics

City development significantly influenced the natural physical characteristics over many years. The hydrological pattern changed due to water extraction at Fountains Valley and the canalisation of the stream over large distances through the city.

Downstream, periodic problems are experienced with embankment erosion and instabilities during floods. Placement of fill material and dense encroachment of exotic vegetation cause abnormalities on land, especially during flood conditions. Ten streams or tributaries flow into the main river:

- Eeufees Spruit;
- Bergklapper Loop;
- Kerameikos Loop;
- Timeball Creek;
- Walker Spruit;
- Steenoven Spruit;
- Skinner Spruit;
- Modder Spruit;
- De Moot Spruit;
- Wonderboom Spruit.

#### 3.5.3.2 Biological / ecological aspects

The stream experiences many ecological pressures. The ecology is under stress due to pollution, invasion of exotic plant species and physical disturbances (dumping, embankment and riverbed disruption).

#### 3.5.3.3 River water

Two springs in Fountains Valley, delivering up to 30 million liters of water per day, are sources for the Apies River. The bulk of this water is distributed into the water network of the city.

Based on water quality guidelines for recreational use, the river is in general usable. Areas with a decrease in water quality are limited. As mentioned the Apies River has ten tributaries also providing water.

#### 3.5.3.4 Environmental assets

Major natural assets include Groenkloof Nature Reserve, Wonderboom Nature Reserve, Bon Accord Dam, the three ridges (Time Ball Hill at UNISA, Witwaters Mountain Range at Daspoort, Magalies Mountain Range at Wonderboom poort) and tributaries of the Apies River.

#### 3.5.3.5 Historical assets

Historical River - There are many places of historical importance all along the river. The most important ones are the following:

- The Wonderboom (*Ficus salicifolia*).
- The artificial waterfall in the poort, installed in 1960.
- House Booyesen
- The graveyard of the Erasmus, Prinsloo and Booyesen family. (Currently being moved to a safer location, due to vandalism) (fig 3.10)
- House Erasmus
- House Zeeland
- Old watering channels

Some of these are still in use and can become a tourist attraction or be upgraded to form part of a new design framework.



fig 3.10: Article about moving the Graveyard (Meyer, 2006)

### 3.5.3.6 WONDERBOOM POORT – URBAN NATURE CONSERVATION

#### Natural characteristics

- Part of proclaimed Nature Reserve
- Minor signs of erosion, river bed stabilised itself after major constructions of transportation routes
- De Moot Spruit joins the Apies River

#### Biological / ecological aspects

- Dominated by indigenous vegetation
- Not many bird species
- Fish and other aquatic life implied, not obvious

#### River water

- Visible pollution by solid waste littering

#### Environmental / historic assets

- Wonderboom Nature Reserve (proclaimed in 1954) indigenous trees, natural bushveld, waterfall, caves with archaeological deposits, fort
- Wonderboom large fig tree (known since mid 19th century)
- Silverton Shale Formation in mountain west side of Poort (rhythmic bedding, lenticular bedding)
- Archaeological Site in mountain west side of Poort (Middle Stone Age site)
- Apies River Poort - open space, access to Pretoria

### 3.5.3.7 NORTHERN APIES RIVER EDGE – URBAN NATURE CONSERVATION

#### Natural characteristics

- Characteristics of a natural river system
- Erosion and embankment disturbances main issue due to building waste and loss of natural vegetation

#### Biological / ecological aspects

- Indigenous vegetation exists, but unnecessary removal and vegetation disturbance
- Aquatic bird life observed
- Fish and other aquatic life visible and implied

#### River water

- Solid waste material deposits through stormwater

#### Environmental / historic assets

- Thomas Pleasure Resort in Pretoria North
- Doors Erasmus farm in Wonderboom area includes historical farmstead and cemeteries east of M1
- Stagecoach Buildings at Wonderboom Agricultural Holdings east of President Steyn Street
- Wonderboom Cemetery north of Wonderboom Nature Reserve
- Pagel Farm in Pretoria North next to R513



fig 3.11: Conserving existing nature and urban environment

### 3.5.4 Movement and Transport

#### 3.5.4.1 Roads

The road system in the vicinity of the Apies River was not planned and designed to provide access to the river itself. The system aims to allow vehicles to either cross the river or to move easily along it. No dedicated parking areas are provided and there are no entrances that give direct access to the river. Road infrastructure can be upgraded relatively easy to perform a river access function, with spare capacity during peak hours the only potential problem. The city's road hierarchy lends itself well to a structured approach to access and parking provision. Bridges are constructed to various designs and don't accentuate the crossings of the Apies River.

#### 3.5.4.2 Public transport

Bus and taxi facilities are inadequate due to the lack of dedicated road infrastructure. Future planning by the Council allows for upgrading of these facilities. With timeous inputs, plans could be amended to cater for requirements of proposed developments along the river. The rail system provides limited access to the Apies River, with stations being few and far apart. With proper planning this can be improved to some extent.

#### 3.5.4.3 Cycle roads

No formal cycle roads along the Apies River are a major shortcoming in the current access system. Cyclists can only use existing roads and streets.

#### 3.5.4.4 Pedestrian movement

Pedestrian movement along the Apies River is restricted to a few precincts. Facilities are in general inadequate, with ample potential for upgrading at a cost that should not be prohibitive.

#### 3.5.4.5 Intermodal nodes

Rail, bus, taxi and car transfer points are few and far apart. They are not aimed at serving the Apies River at all. Planning inputs could alter the situation and should be pursued without delay. The only intermodal nodes are the taxi ranks towards the northern part of the CBD.



fig 3.12: Movement and transport

Road sides are used for taxi stops and informal trade. The stations do not read as part of the urban fabric. It is difficult to read how to enter and exit the stations, especially the Pretoria North station.

### 3.5.4.6 WONDERBOOM POORT - MOVEMENT AND TRANSPORTATION

#### Accessibility

Visibility high, accessibility low, no direct access

- Cars - bad
- Taxis - bad
- Buses - bad
- Rail - bad
- Cycles - bad
- Pedestrians - average

#### Capacity

Virtually full capacity peak hours

- Cars - bad
- Taxis - bad
- Buses - bad
- Rail - bad
- Cycles - bad
- Pedestrians - average

#### Potential

Little potential for expansion or providing access due to geography

- Cars - bad
- Taxis - bad
- Buses - bad
- Rail - bad
- Cycles - good
- Pedestrians - good

### 3.5.4.7 NORTHERN APIES RIVER EDGE - MOVEMENT AND TRANSPORTATION

#### Accessibility

Strong transport axes but access to river can only be gained over private land

- Cars - bad
- Taxis - bad
- Buses - bad
- Rail - average
- Cycles - bad
- Pedestrians - bad

#### Capacity

Spare capacity off peak

- Cars - average
- Taxis - average
- Buses - average
- Rail - average
- Cycles - bad
- Pedestrians - bad

#### Potential

Positive for improvement with careful planning

- Cars - good
- Taxis - good
- Buses - good
- Rail - average
- Cycles - good
- Pedestrians - good



fig 3.13: Dominated by cars and trains, no safe pedestrian or cycle movement (Tshwane)

### 3.5.5 INFRASTRUCTURE & SERVICES

Being canalised and fixed with a concrete lining over large sections, the river bank became an urban spine along which installation of municipal services became convenient

#### 3.5.5.1 Stormwater

To drain stormwater more effectively, large sections of the Apies River were canalised and lined with a concrete lining or gabion protection. This restrained the effect of flooding and reduced the possibility of loss of life and damage to property.

Through the following precincts, the profile of the Apies River is still that of a natural river course:

- Fountains Valley;
- UNISA Poort;
- Pretoria Zoo;
- Marabastad (lower part);
- Wonderboompoort (lower part);
- Annlin;
- Onderstepoort; and
- Bon Accord.

Floodlines vary between 10 meter in Marabastad (upstream) and 350 meter at Bon Accord Dam. Dumping has a serious impact on floodlines in Onderstepoort and Annlin.

#### 3.5.5.2 Water

An average of 26 mega litres are pumped daily from the Fountains pump station into the Pretoria water supply system. Major pipelines up to 900 mm diameter from the Rietvlei Dam and Fountains occur along both banks of the river in Fountains and UNISA Poort. In the urban sections of the river, minor underground domestic pipes run along street reserves.

#### 3.5.5.3 Electricity

In urban precincts many electrical cables are close to the river where the river banks are lined with concrete. Lower down the river a 132 kV Pretoria-Rooiwal overhead power line criss-crosses the river up to the southern side of Bon Accord Dam.

#### 3.5.5.4 Sewerage

The banks of the Apies River are part of a major service spine for main sewer lines. They vary in size from 600 mm diameter at Fountains to 1800 mm diameter near Bon Accord Dam. Urban precincts are provided with sewer lines in the road reserves. At Daspoort Water Care Works an average of 35 mega litres effluent waste water are daily let into the river, with water quality being monitored on a weekly basis.



fig 3.14: Infrastructure and services in bad condition and not aesthetically pleasing

### 3.5.5.5 WONDERBOOM POORT - INFRASTRUCTURE & SERVICES

#### Stormwater

- Earth channel with gabion protection
- 50-year floodline: 70 m
- Surface drainage

#### Water supply

- Domestic water supply in road reserves
- Reservoir
- Major pipe crossing just north of poort: 200Ø , 450Ø and 600Ø

#### Electricity

- Overhead 132 kV powerline on left bank

#### Sewerage

- 1800Ø on right bank
- 900Ø on left bank

(Holm, P30)

### 3.5.5.6 NORTHERN APIES RIVER EDGE - INFRASTRUCTURE & SERVICES

#### Stormwater

- Natural course
- 50-year floodline: 250 m
- Surface drainage and underground pipes

#### Water supply

- 110Ø on left bank
- Domestic water supply in road reserves

#### Electricity

- Overhead 132 kV powerline on left bank

#### Sewerage

- 1800Ø on left bank
- 300Ø on right bank

(Holm, P32)

### 3.5.6 PUBLIC AMENITIES

#### 3.5.6.1 Social Infrastructure

A large number of institutions and other social infrastructure are established relatively close to the river in the inner city. Various museums, libraries, educational institutions, health and care facilities, sport and recreational facilities are close to the river in the inner city. The Hospital Precinct has the largest amount of facilities but they, in general, "ignore" the river, turning their backs on the open space. Precincts outside the city have limited social facilities within 10 minutes walking distance of the river.

#### 3.5.6.2 Public furniture

A general lack of public amenities and public furniture are an obvious problem. Lighting, benches, litter bins and drinking fountains are either neglected or totally lacking. Only in the Caledonian Precinct is new street furniture provided as part of the upgrading of the road network. There is, however an unintegrated implementation and design of only one side of the river.

#### 3.5.6.3 Maintenance and care for public and communal spaces

The total Apies River area is very much neglected and unmaintained. Maintenance is the responsibility of different Council Departments, with channeled reaches falling under the responsibility of the Department of Transportation Engineering and Roads and natural water course reaches falling under the Department of Culture and Recreation. Only reaches on Council's property are maintained, with the maintenance of the river through private property being the responsibility of private owners. It is advisable to combine the relatively low cost of maintenance with high scientific, educational, aesthetic and recreational value. Through creative ecology, maintenance cost could be reduced to less than

those of formal parks. All unbuilt land is not regarded as accessible open space and is not properly managed.



fig 3.15: No public furniture along informal pedestrian movement



fig 3.16: No safe river crossings for pedestrians, vehicle crossings used for pedestrian movement

#### 3.5.6.4 WONDERBOOM POORT - PUBLIC AMENITIES

##### Social infrastructure

- No facilities

##### Public furniture

- None

##### Maintenance and care

- Relatively good

#### 3.5.6.5 NORTHERN APIES RIVER EDGE - PUBLIC AMENITIES

##### Social infrastructure

- No facilities

##### Public furniture

- None

##### Maintenance and care

- Damage to river banks



fig 3.17: An existing public meeting place

### 3.6 Main Concerns

- The river is not legible within the urban structure and not part of an integrated open space system.
- The river area is neglected, with the back of adjacent developments turned towards the river.
- The river area is unsafe, with no lighting and adjacent land uses not promoting activities on the river banks.
- Most of the time little water is running along the canal, with no constant flow.
- There are ecological and urban decay along different parts of the river.
- There is bulk infrastructure along large parts of the canal banks.
- Development pressure is not appropriately managed and guided.
- The river is unsafe during storms and floods.
- There are no public amenities, or any pedestrian or cycle routes along the river.
- The river canal is difficult to maintain and clean (no vehicular access is possible and it is difficult for a person to get into and out of the concrete canal).
- Illegal dumping occurs in the floodline.
- Erosion exists in large parts.



### 3.7 Conclusion

The next step will be to create a master plan and development framework for this area, and linking it to the surrounding urban fabric. The master plan must create a balance between economic and ecological opportunities and constraints. It is important to incorporate all existing features, natural and historical, into this new master plan development. The development should encourage developers to invest in this area and by doing so adding to the economic and visual value of this part of Tshwane.

