



Photo 1: D.M. Wentzel



Photo 3: D.M. Wentzel



Photo 2: D.M. Wentzel

Development Framework

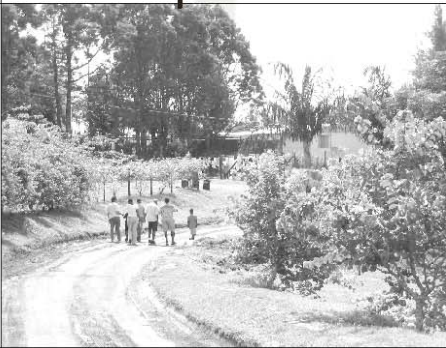


Photo 4: D.M. Wentzel



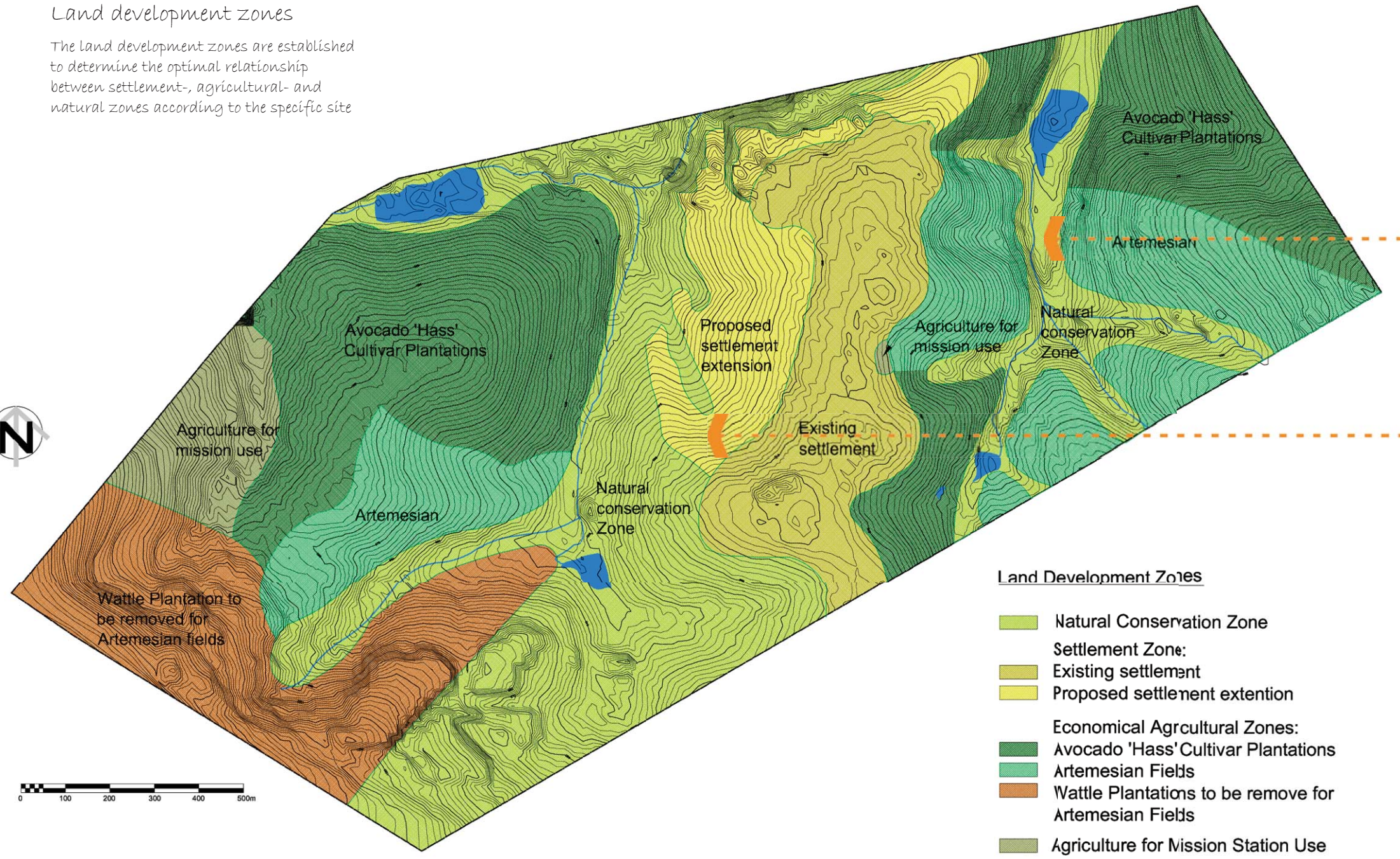
Photo 5: D.M. Wentzel



Photo 6: D.M. Wentzel

Land development zones

The land development zones are established to determine the optimal relationship between settlement-, agricultural- and natural zones according to the specific site



Land Development Zones

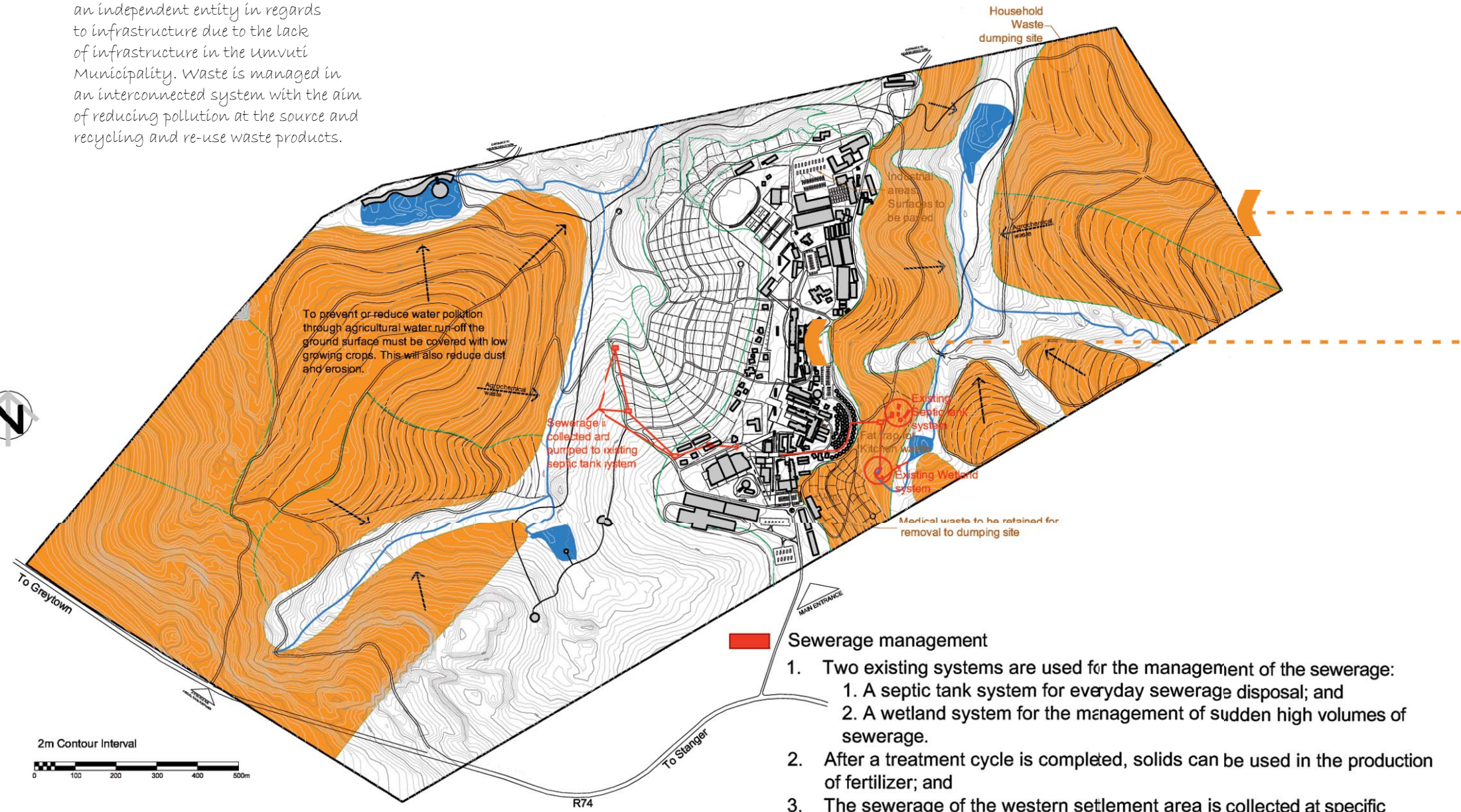
- Natural Conservation Zone
- Settlement Zone:**
- Existing settlement
- Proposed settlement extension
- Economical Agrcultural Zones:**
- Avocado 'Hass' Cultivar Plantations
- Artemesian Fields
- Wattle Plantations to be remove for Artemesian Fields
- Agriculture for Mission Station Use

■ Approximately 30% of the site is to be rehabilitated to represent the Mist Belt Grass Biome. 60% of these 30% will be used for a game and bird sanctuary.

■ Proposed extension of residential area of settlement in previous kikuyu fields.

Waste management

Kwasizabantu must function as an independent entity in regards to infrastructure due to the lack of infrastructure in the Umvoti Municipality. Waste is managed in an interconnected system with the aim of reducing pollution at the source and recycling and re-use waste products.



Sewerage management

1. Two existing systems are used for the management of the sewerage:
 1. A septic tank system for everyday sewerage disposal; and
 2. A wetland system for the management of sudden high volumes of sewerage.
2. After a treatment cycle is completed, solids can be used in the production of fertilizer; and
3. The sewerage of the western settlement area is collected at specific points and pumped to the eastern side of the settlement where it flows down with the natural slope to the existing septic tank.

All soil surfaces must be covered either with hard landscaping or vegetation to prevent dust pollution or the disposal of sediment in water courses.

Settlement should be designed for the ease of pedestrian movement. This will reduce the use of vehicles and the associated air pollution.

Agricultural waste management

Agricultural sources recognised for waste management:

1. Agrochemicals in soil fertilizers and insecticides, as well as runoff from farm lands results in the pollution of water resources; and
2. Dust due to agricultural activities contributes to the air pollution.

Source-based control for the reduction of waste:

1. Slope stabilisation through tillage parallel with contours;
2. Road surfaces must be paved or covered to prevent soil erosion;
3. All natural areas must be covered with planting; and
4. Agrochemicals must be reduced to the absolute minimum.

Settlement waste management

(An existing household waste-dumping site, in accordance to SABS standards, can be found at the north-eastern boundary of site)

Industrial waste

1. Areas to be paved to prevent chemicals seeping through to the soil;
2. Storm-water runoff to be retained in detention pond and purified according to special requirements for industrial waste; and
3. Separate waste dumping point according to SABS standards.

Kitchen waste

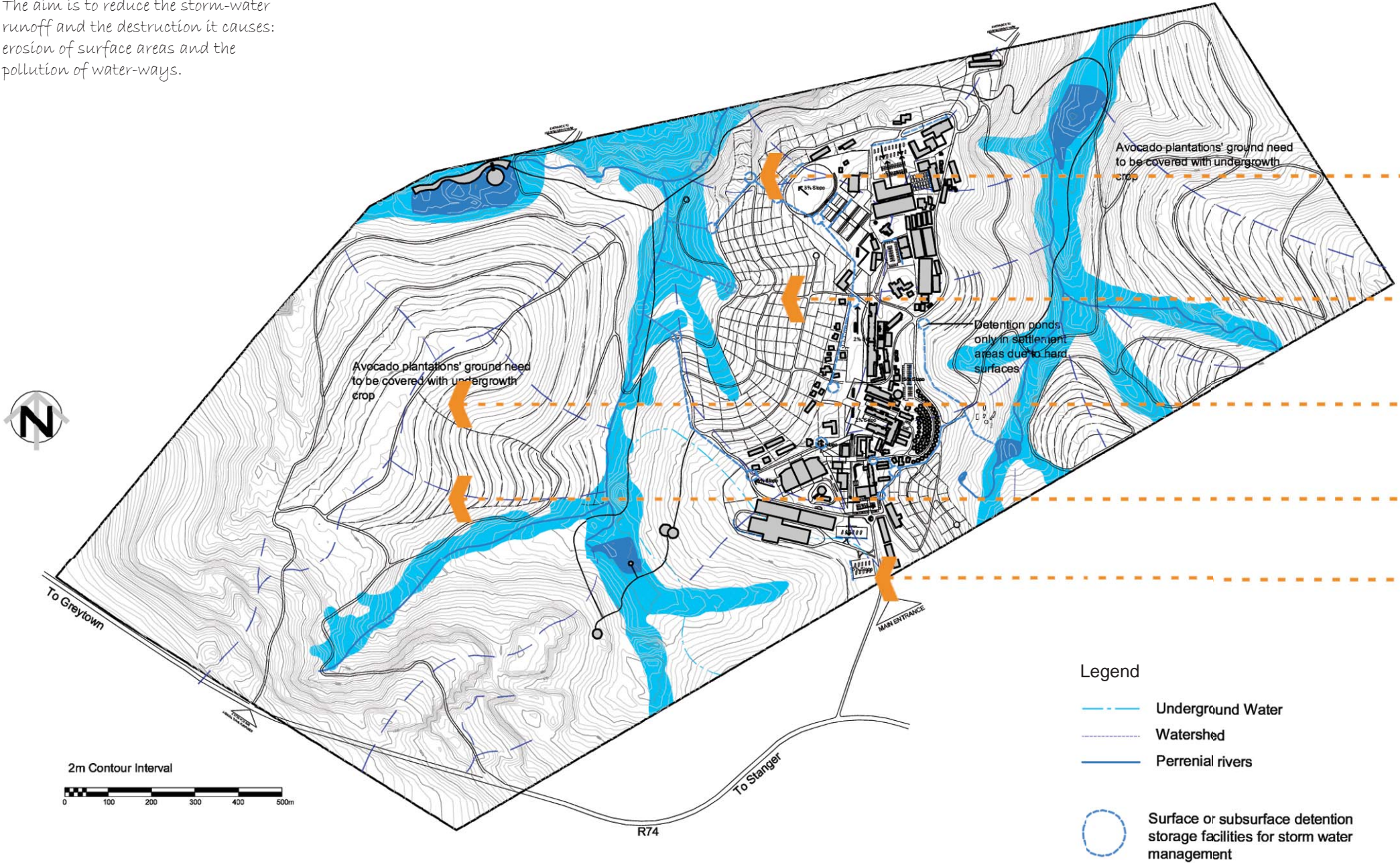
1. Kitchen waste water runs through a fat trap before entering the main system; and
2. Kitchen solid waste to be used for the poultry farm as far as possible.

Medical waste of AIDS care centre

1. Solid waste to be retained for the removal to closest specified medical dumping site; and
2. Sewerage system to be connected to main system, with emphasis placed on no chemicals being thrown into the sewerage system.

Drainage management

The aim is to reduce the storm-water runoff and the destruction it causes: erosion of surface areas and the pollution of water-ways.



- Legend
- Underground Water
 - Watershed
 - Perennial rivers
 - Surface or subsurface detention storage facilities for storm water management

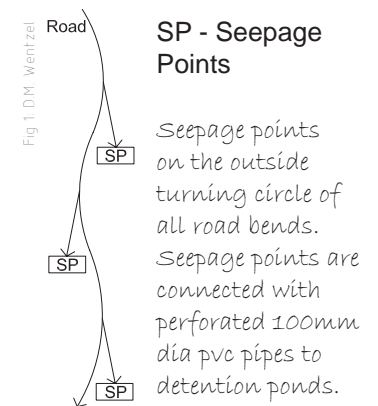
Detention ponds are located only in settlement areas, due to the vast amount of water run-off accumulated because of hard surfaces.

Streets to be used as storm water conveyance channels to the retention ponds, where water must be treated before it is channeled to the four different dams for disposal. This is to ensure water quality suitable for the environment. For road design refer to Figure 1.

Avocado plantations must be covered with undergrowth crops such as: velvet beans, soya-beans, ration beans, cowpeas, medics, wheat, rye, barley, teff, vetches, desmodium or groundnuts, to reduce storm-water runoff

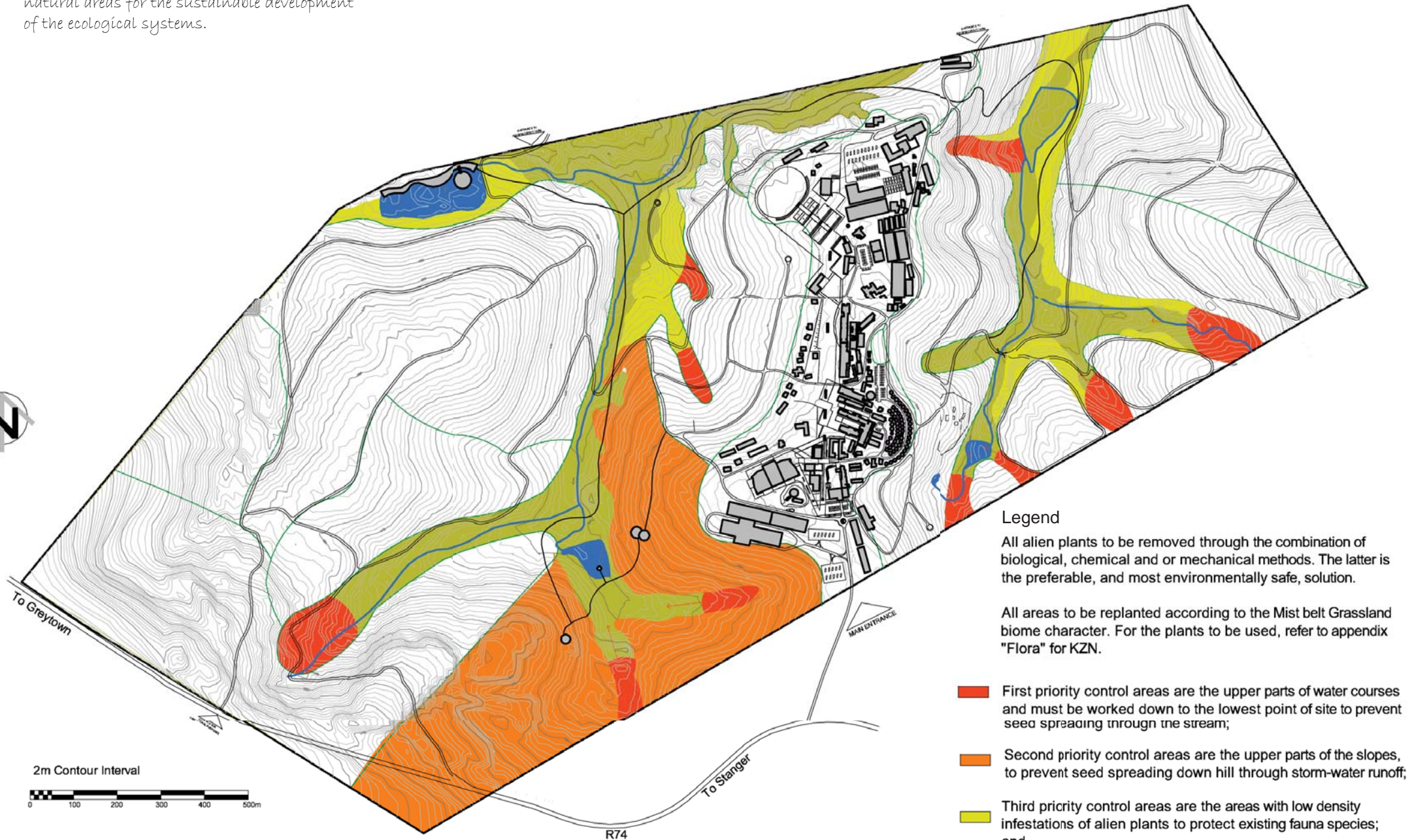
Artemesian fields are terraced and plowed parallel with contours which are ideal for storm-water runoff reduction.

Parking areas must be of solid robust materials to reduce polluted water (due to oil leakage) entering natural systems. This water must be collected at a central point and treated before entering the natural systems.



Natural conservation management

Natural Conservation Management is for the rehabilitation and conservation of the natural areas for the sustainable development of the ecological systems.



Legend

All alien plants to be removed through the combination of biological, chemical and or mechanical methods. The latter is the preferable, and most environmentally safe, solution.

All areas to be replanted according to the Mist belt Grassland biome character. For the plants to be used, refer to appendix "Flora" for KZN.

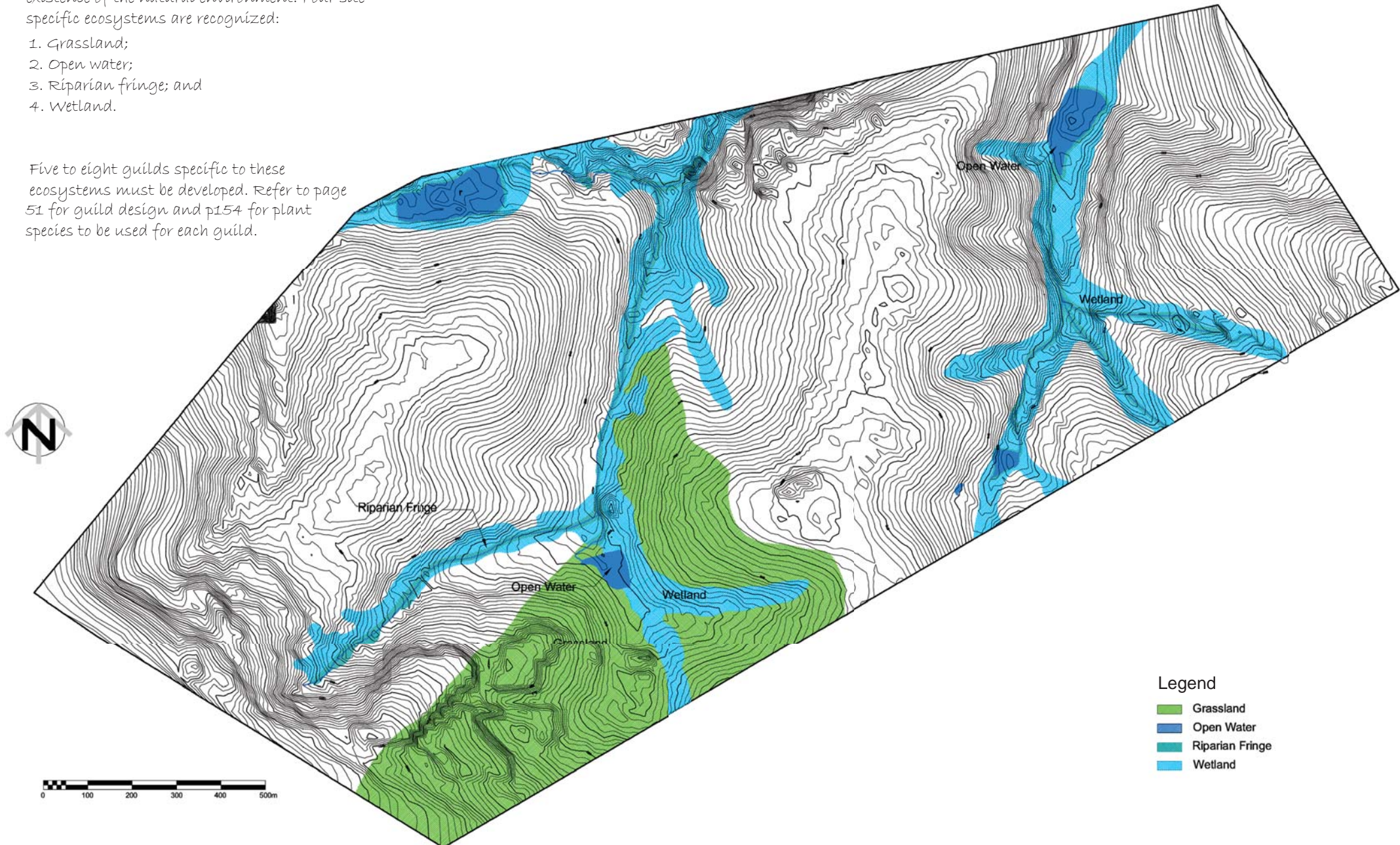
- First priority control areas are the upper parts of water courses and must be worked down to the lowest point of site to prevent seed spreading through the stream;
- Second priority control areas are the upper parts of the slopes, to prevent seed spreading down hill through storm-water runoff;
- Third priority control areas are the areas with low density infestations of alien plants to protect existing fauna species; and
- Remaining areas

Function-base habitat design

The rehabilitated areas' Mist Belt Grassland Biome character must be established for the sustainable existence of the natural environment. Four site-specific ecosystems are recognized:

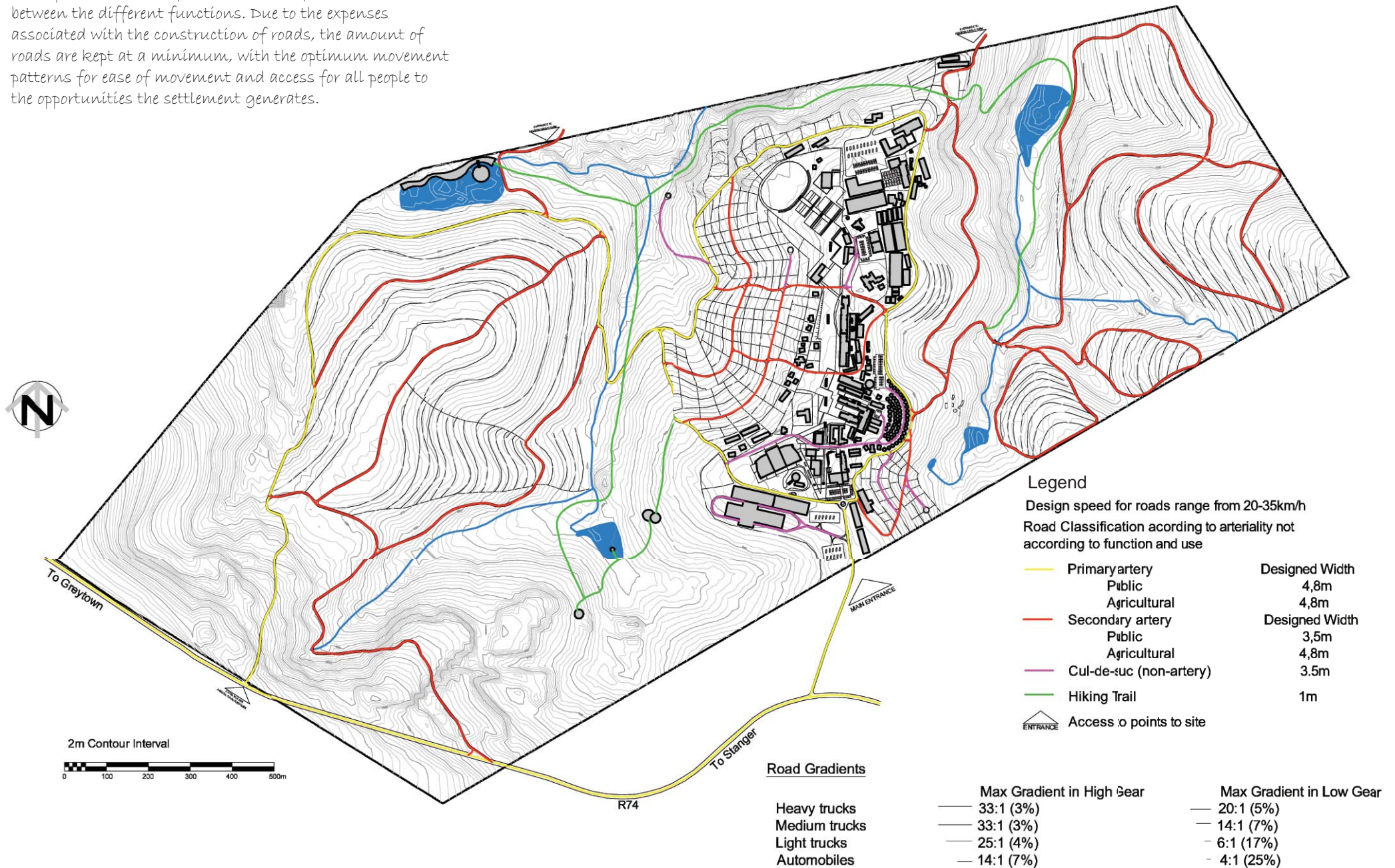
1. Grassland;
2. Open water;
3. Riparian fringe; and
4. Wetland.

Five to eight guilds specific to these ecosystems must be developed. Refer to page 51 for guild design and p154 for plant species to be used for each guild.



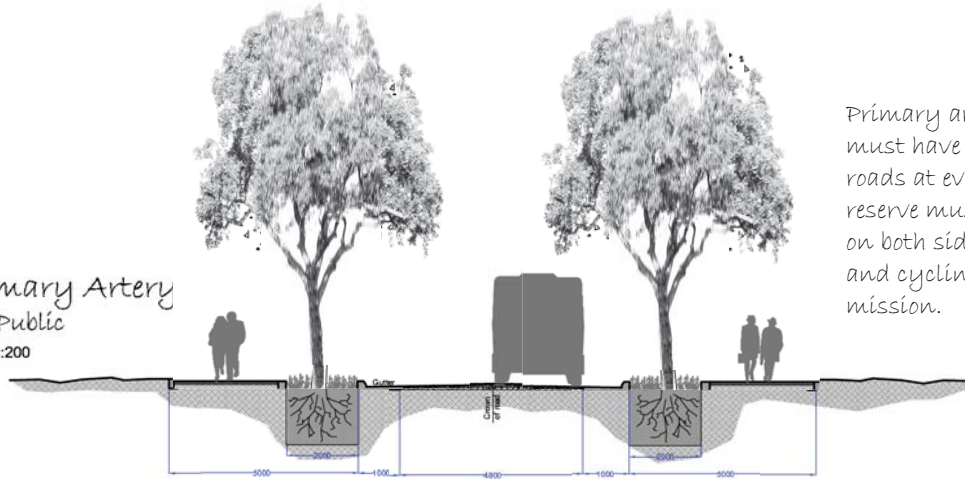
Circulation design

Roads form the structuring mechanism in the proposed development area and form a network of connections between the different functions. Due to the expenses associated with the construction of roads, the amount of roads are kept at a minimum, with the optimum movement patterns for ease of movement and access for all people to the opportunities the settlement generates.



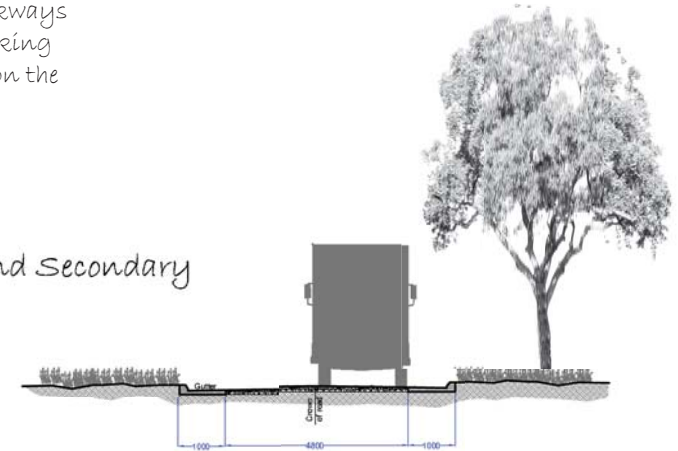
Design proposals for different street types

Primary Artery
For Public
Scale 1:200



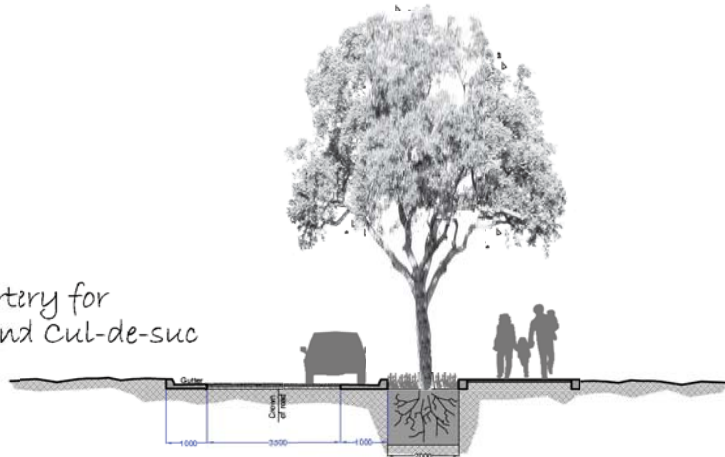
Primary artery roads for public areas must have trees on both sides of the roads at every 7m interval. A 5m road reserve must be kept with 2m walkways on both sides to provide in the walking and cycling culture of the people on the mission.

Primary and Secondary Artery
For Agriculture
Scale 1:200



Primary and secondary artery roads for agricultural areas must consist of only the constructed roads laid out in the landscape. All vegetation next to the road must be either natural or part of the agricultural production. No provision for walkways are made due to the low volumes of traffic on the roads.

Secondary Artery for
Public areas and Cul-de-sac
Scale 1:200



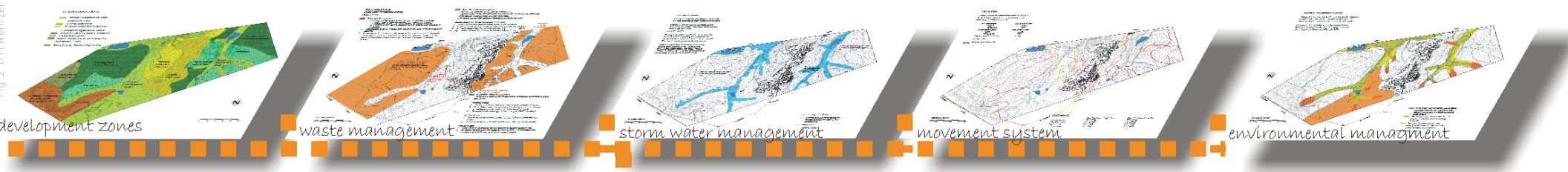
Secondary arteries for public areas and cul-de-sac roads form the movement system within the residential areas. These roads are only 3,5m wide with an additional 1m open gutter a both sides. The width is determined according to the low volumes of traffic. Traveling on site is predominantly pedestrian, or by bicycle and motorbike.

Hiking Trail
Scale 1:200

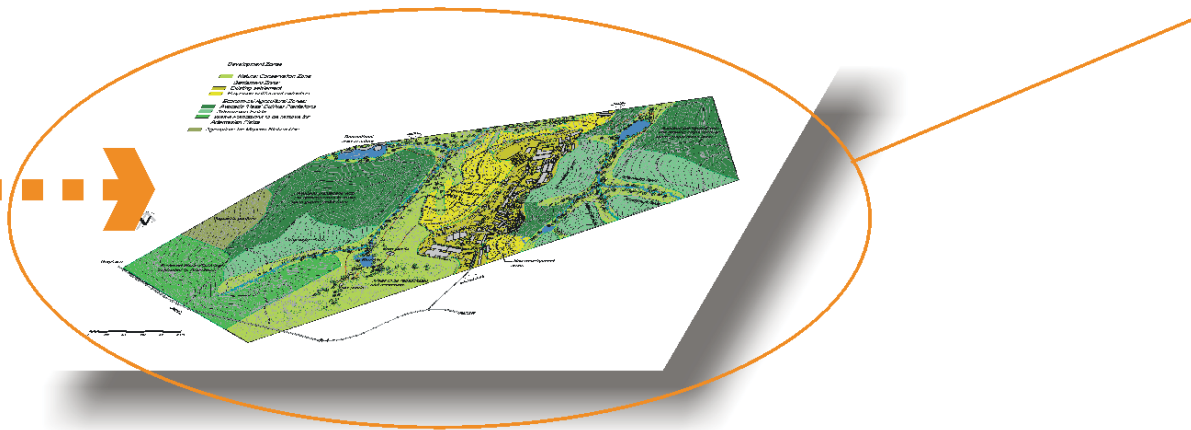


Hiking trails are 1,2m wide, and elevated 400mm above ground. This prevents the erosion of walkways due to constant movement over uncovered surfaces.

Fig. 2. D.M. Wentzel

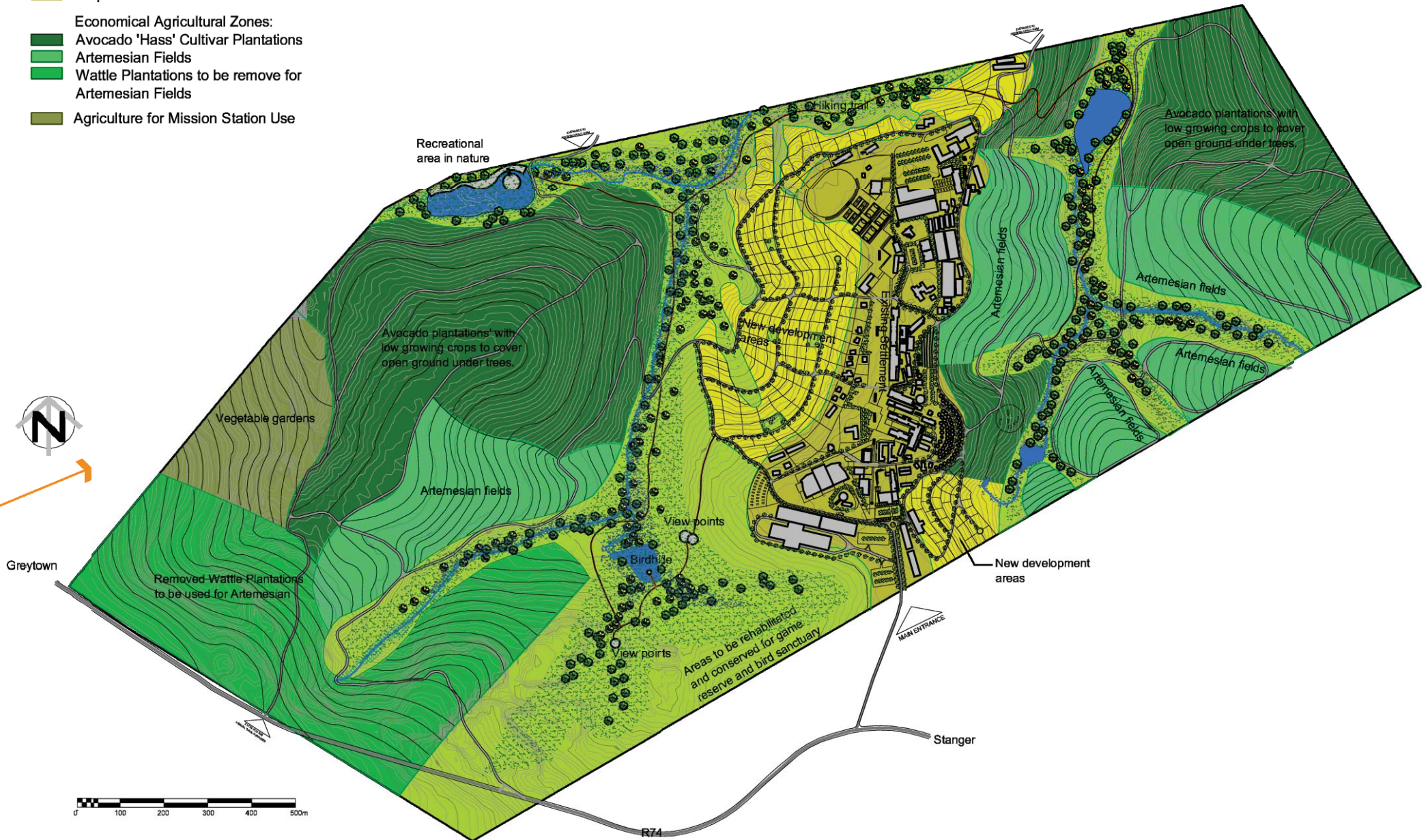


The development framework as a synergy of these layers and the design of the site as a whole.



Site development framework

- Natural Conservation Zone
- Settlement Zone:
 - Existing settlement
 - Proposed settlement extension
- Economical Agricultural Zones:
 - Avocado 'Hass' Cultivar Plantations
 - Artemesian Fields
 - Wattle Plantations to be remove for Artemesian Fields
 - Agriculture for Mission Station Use



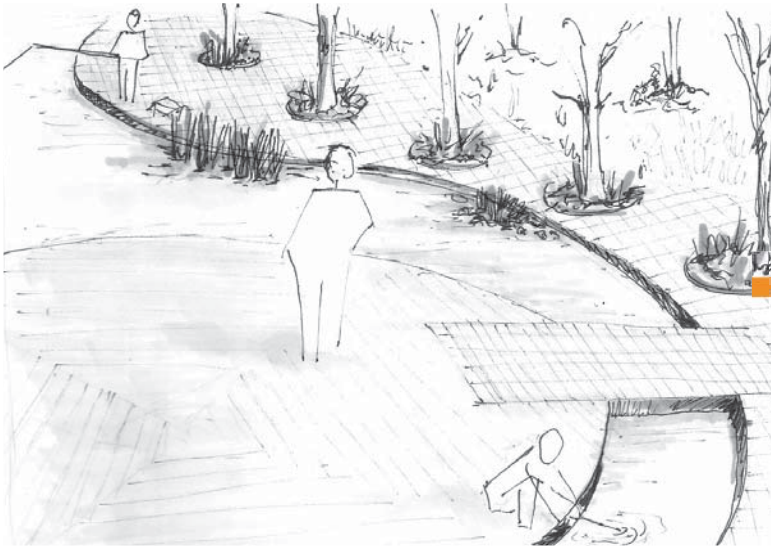


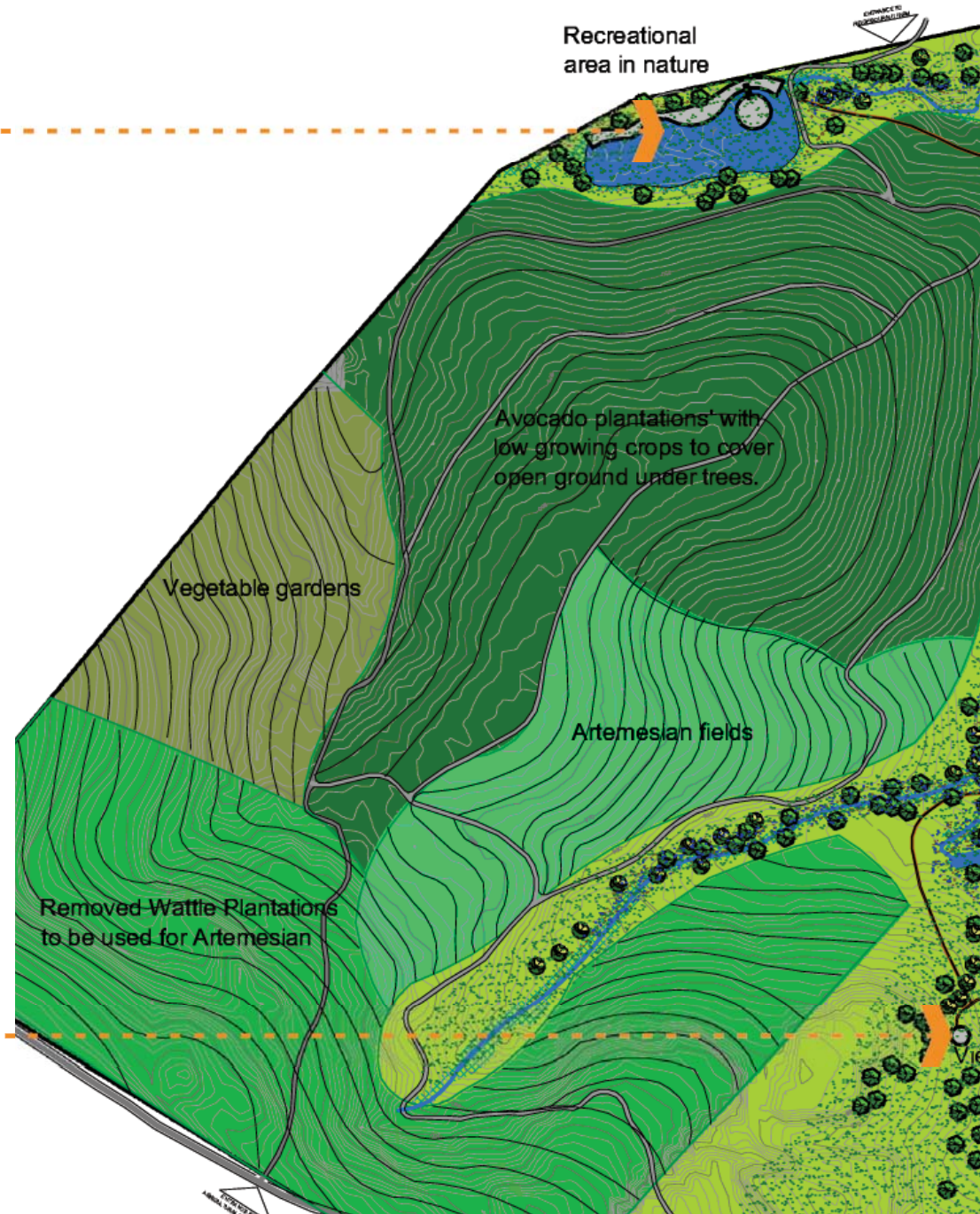
Fig. 3. D.M. Wentzel

Recreational area at the dam for relaxation and the social gathering of the community.



Fig. 4. D.M. Wentzel

View points on the hiking trail enables the people to enjoy a view over the valley and animals of the game reserve.



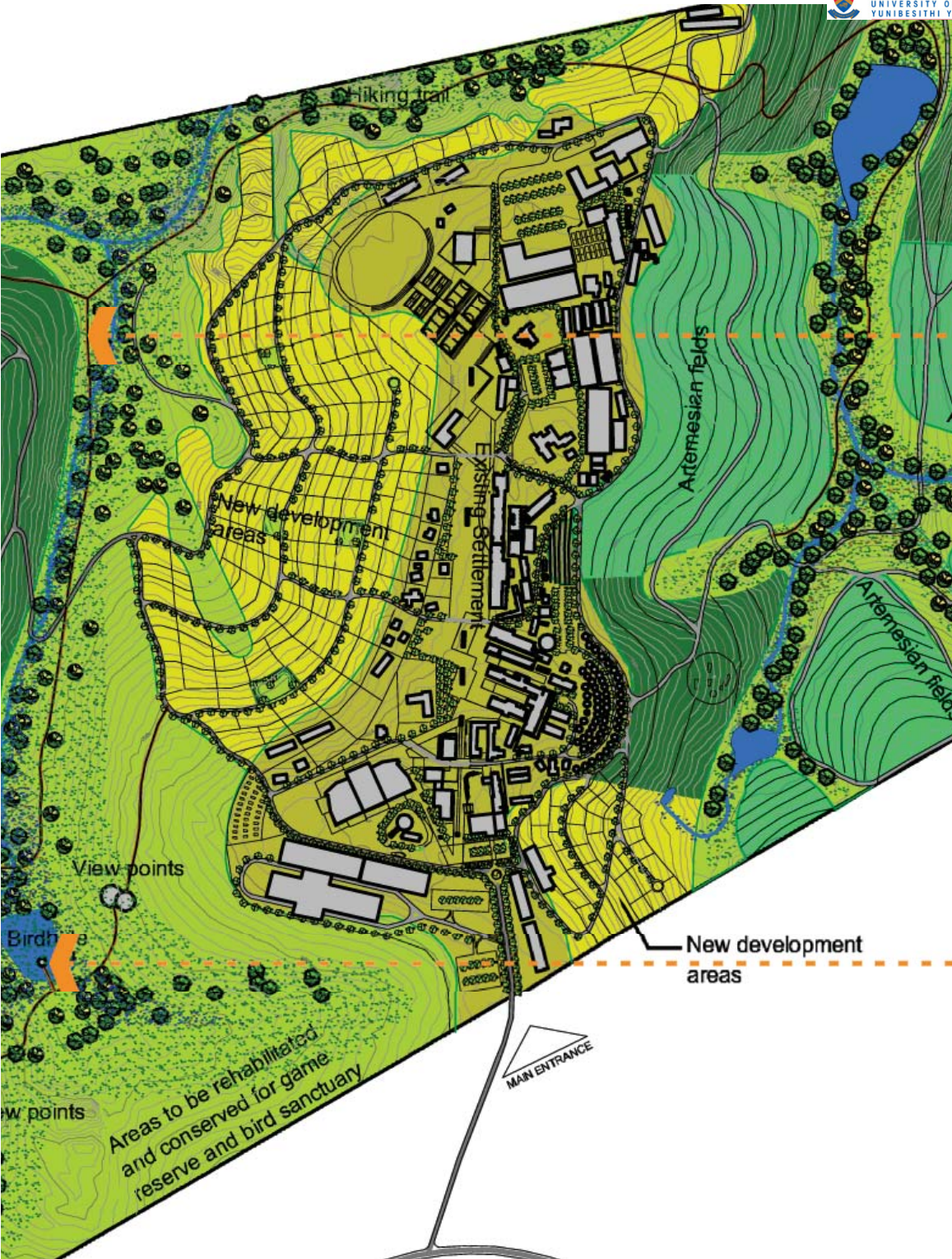
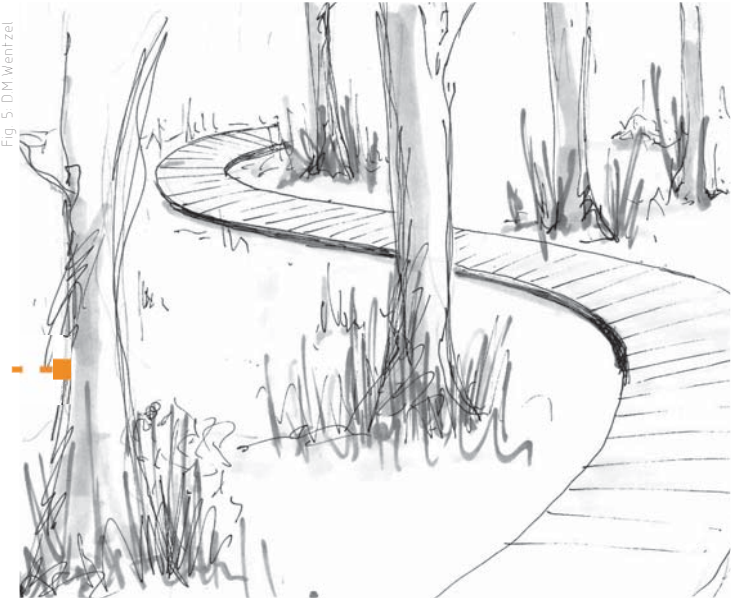


Fig. 5. D.M. Wentzel



Hiking trail, the extension of the settlement into the natural valley.

Fig. 6. D.M. Wentzel



Bird Hide: Through interaction with nature people will learn to appreciate the natural environment and will be able to act as stewards of nature.