

## APPENDIX

### NEWLANDS MASHU PERMACULTURE LEARNING CENTRE

#### Funding requirements for Irrigation System

The Centre prides itself in promoting low external input sustainable agricultural (LEISA) practices. As part of its irrigation system, many swales with vetiver grass have been established to harvest rainwater and thus reduce the usage of mains water supply. However, there are several improvements that can be made to the current irrigation system in order to make it more sustainable, especially since some R2,000 per month is being spent on mains water supply. The improvements to the irrigation system as illustrated in the attached Site Plan include:-

1. The installation of a "reverse osmosis plant" to desalinate the water from a borehole which was sunk at the inception of the project but which water cannot be used due to its high salinity.
2. The installation of four 10ML water tanks complete with stands at the top of the site.
3. The installation of a rising water main from the borehole to the four 10ML tanks.
4. The completion of the rainwater harvesting system by excavating and lining several small detention ponds, and, associated stormwater channels and swales planted with vetiver grass.

The funding requirement for the completion of the irrigation system is contained in Table 1 below and includes all costs and VAT.

Table 1 - Funding requirement for the completion of the irrigation system

Item	Task	Description	Estimate
1	Reverse osmosis plant	Complete plant with solar powered water pump @ R80,000 installed by specialist	R80,000
2	10ML water tanks	Four 10ML water tanks complete with stand @ R6,000 each	R24,000
3	Rising water main	± 200 metres of 70mm dia. water pipe including trenching, couplings and valves @ R150/m plus 5 metres of pipe laid under driveway @ R500/m	R32,500

Item	Task	Description	Estimate
4	Small dams and extension of the rainwater harvesting system	Excavation to 4 small dams ± 200m2 @ R60/m2; ± 20 m2 of sand blinding @ R80/m2; ± 300 m2 dam lining @ R30/m2; ± 300m of swales @ R30/m	R32,000
Sub-Total			R168,500
VAT			R23,590
<b>Total</b>			<b>R192,090</b>

The time frame for completing the irrigation system is estimated to take some 3 months as shown in Schedule 1 below.







Schedule 1 - Time frame for completion of irrigation system

Item	Description	Month 1	Month 2	Month 3
1	Reverse osmosis plant			
2	10ML water tanks			
3	Rising water main			
4	Small dams and extension of the rainwater harvesting system			
Monthly Cash Flow		R45,600	R55,290	R91,200
<i>Cumulative Cash Flow</i>		<i>R45,600</i>	<i>R100,890</i>	<i>R192,090</i>

# NEWLANDS MASHU PERMACULTURE LEARNING CENTRE

## Site Plan for Irrigation System



-  10MI water tank
-  Small dam
-  Water surface flows
-  Borehole
-  Rising main
-  Water channel