Rainwater harvesting

This statement explains how the proposal will replace the current mains water usage on the farm. The required rain water re-cycling can easily be achieved using the existing infrastructure by adding gutters and associated automation. The polytunnel side bars are designed to have gutters fitted.

To achieve Water Neutrality it is proposed that a minimum of 70m3 of additional rainwater is harvested annually. This water is required for the in-ground and hydroponic growing of fruit and vegetables.

Rainwater will be harvested from the existing poly tunnel roofs. Please see the attached plans showing the location of the poly tunnels and two main collection tanks, along with elevations of the water storage tanks. There are also a number of other storage tanks inside and around the polytunnels, that are used for direct watering and the mixing of water and plant nutrients. This includes 1 x 6000 lite tank; 4 x 2500 litres tanks, 1 x 1250 litre tank and 6 x 1000 litre tanks.

The water collected via the proposed polytunnel gutters and pipes will drain into the two main tanks. There is a large storage tank of 100 m3 litres capacity (which is currently filled by at least 70m3 of mains water each year). There is a second replacement tank of 36m3 which is currently being installed and which will be used for recycled rather than mains water as part of the water neutrality proposal.

Harvested rainwater from the new poly tunnel gutters will initially flow into the tank of 36m3. The water from this tank will be pumped into the feed tanks for the hydroponic plants or up to the larger 100m3 tank. The hydroponic feed tanks have their own storage of 21m3. These tanks will be topped up automatically from Tank 2 using our computer control system for the farm.

Looking at the calculation below this shows that we need an additional 10304l of RWH to supply the necessary water on the nursery and to replace that taken from the mains. This can be met comfortably by using the water collected from gutters on polytunnels 2 or 3.

	Value	Unit	Notes
Rainfall in this location	858.7	mm/a	
Rainfall including climate impact (10% rainfall reduction)	858.7	mm	
Collectable rainfall volume	0.8587	m3/m2	
Collection areas			
Poly Area 1 (existing)	175	m2	already in place, to 96,000l tank
Poly Area 2	140	m2	not yet collected, for offset (70m3)
Poly Area 3	148	m2	not yet collected, for crops
Poly Area 4	94	m2	not yet collected, for offset (70m3)
Total **additional** potential collection area	382	m2	
Maximum annual rainfall volume	328	m3	
Hydraulic filter efficiency (whole site)	0.9		
Yield co-efficient - all poly tunnels	0.9		
Actual annual potential collection volume	**266**	**m3**	
Poly Area 2	97.4	m3	
Poly Area 3	102.9	m3	
Poly Area 4	65.4	m3	
WN Offset required	76.542	m3	As calculated in report
Farm daily water demand	206	l/day	As calculated in report from meter readings
Farm annual water demand	75250	litres/a	As calculated in report from meter readings
Total 50 days storage to allow for drought	10,304	litres	This is the min. additional RWH tank size needed to service the crop irrigation
Offset achieved by improving WE in farmhouse	18323	litres/a	
Total combined offset	**93573**	**litres/a**	

Source: Deadalus Environmental

Between them the replacement storage tank and the existing feed tanks have capacity of 57m3 of rainwater. This is in addition to the existing 100m3 storage tank.

For the farm, rainwater is ideal since it has the correct PH level for plants and no background EC that in turn helps with the nutrient recipes we give to the crops. So, for the farm, the additional rainwater harvesting is both easy and helpful.

Looking at the proposed new house system, the roof has an area of 100m2. This water will be collected and will flow into the existing 100m3 using the existing infrastructure. The water to serve the house and associated staff facilities will be pumped back to the proposed development via an existing commercial sand filter.