



## INFO SHEET 1: Supply & Filtration

### **Saltwater Supply**

We use local seawater pumped up through a pipeline on the harbour wall. Although this is a river estuary (The Ellen) towards full tide the fresh water is displaced upwards as it is less dense and we can pump in full strength seawater.

### **Filtration**

Initially we need to reduce the sediment load which is naturally high anyway in the Solway . This is done by pressure sand filtration. The clear water is then introduced to the displays on a demand basis having passed through an ultra violet irradiation plant.

### **Temperature Control**

From about the end of May to the end of September we have to cool the water ( maximum 16 degrees C ) by passing the circulating water through a heat exchanger.

### **Water Quality Control**

We keep things simple and relatively low-tech for reasons of low running costs and reliability. Simple air lifted filter beds in virtually all displays look after total ammonia levels ( we have never had anything other than normal readouts). All displays have a constant through flow of re-circulated water so water quality conditions are constant throughout. Several small pressure sand filters on the larger displays keep water clarity very acceptable. Use of protein skimmers and ozonation would doubtless achieve clearer water but at the cost of the many pretty invertebrates which have colonised the tanks which would starve to death!.

### **Water Turnover**

A reasonable turnover of water is achieved by regular topping up of the system to replace the water lost when the sand filters are back-flushed. We estimate the whole system is turned over every 3-4 months.

### **Oxygenation**

Every display has one or more airlifts that ensure water movement, full aeration, and also drive under gravel filter grids. The combination of water through-flow and aeration means there are two life support systems acting as back-ups for each other.