



Bio-Bubble chosen for **Rathfinny Estate** set to become the **largest** single site **vineyard & winery** in Europe!

When Mark Driver, a successful Hedge Fund manager, ordered a Bio-Bubble waste water treatment plant for his new, what will eventually be, largest single site vineyard and winery in Europe, one could not help being quietly chuffed. A man like Mark always does his homework so naturally we were very proud to be chosen to provide Rathfinny Estate with a state-of-the-art waste water treatment plant. When the new winery is up to full production of circa 1 million bottles of Sussex Sparkling Wine, we will be delighted that we will have played a small part for the business by dealing with the 40 m³/day of waste water during the seasonal production.

As landowners operating within The South Downs National Park, Mark and Sarah, owners of Rathfinny Estate, wish to produce an award winning Sussex Sparkling Wine in the most environmentally friendly manner possible. Effectively, dealing with the waste water from a winery is a challenge. Globally, the usual methods adopted are fairly ineffective. The challenge was enforced due to the Winery being located within the National Park and also the need to ensure the final effluent quality was good enough to have absolutely zero threat to both the winery's own borehole supply, as well as the local water company's borehole, where much of the final effluent will be recycled to aquifer recharge. Expert consultants were engaged to determine that no risk to the aquifer existed.

The Advanced Aeration process, providing the full biological treatment to the winery's waste water has a variation of an activated sludge process with a long sludge age, the system based upon a sequenced batch reactor (SBR) is ideally suited because it can operate successfully with feast and famine conditions. The plant has to cope with large seasonal fluctuations in load typical with wineries; vast quantities of waste are produced for just 2 ~ 3 months in a year, the waste is typically 15 ~ 20 times organically stronger than sewage waste and processing circa 1,200 metric tons of grapes means the treatment plant has a population equivalent to circa 2000 PE, 2.5 times the population of Alfriston. As a contrast for the other 9 months, the only waste produced is by permanent staff and visitors.

A biological process takes time to become established (usually 6 ~ 8 Weeks from start up) to have a plant that was switched on at the start of production would mean the effluent quality would have been poor until half way through the season, further to this nutrients required for an effective process would be deficient if the winery waste alone was treated, imported nutrients would have been needed. To combine the sewage waste streams from the winery staff and accommodation block and mixing it with the winery waste means delivery of expensive imported nutrients is reduced but more importantly the Biological process can be fed to keep it biologically potent and be ready for the start of the peak season.

The Bio Bubble process is a modular design facilitating growth in line with the business' plan as well as probably being the most environmentally friendly process on the market.

- Energy usage and the energy required to digest the organic load received at the plant is monitored and linked to site and the Bio-Bubble Process Engineers via a broad band link.
 1. Oxygen levels - that is the amount of diffused oxygen adsorbed into the waste water - is regularly monitored, once sufficient levels are reached for the given load the system is programmed with the intelligence to react cutting back energy use by variable speed drives and shortening aeration duration.
 2. Flow volumes are monitored so that should there be insufficient waste to warrant initiation of a process cycle, a sleep mode cycle would be selected to save further energy. In essence the plant only works when there is something to do.
 3. The use of deep vessels within which to collect and store as well as process the waste has a direct relationship to Kilowatt Hours of energy used, whilst initial capital expenditure is greater the payback in Energy saving and carbon footprint is more than adequate justification.
 4. A process cycle always operates with the Reactor Full to the design top water level, coupled with using Micro Bubble Diffusers each bubble with maximum surface area in contact with the water for an extended duration due to the depth makes for the least amount of energy and smallest motor size to gain the required Oxygen levels in the water. The same volume of air made up of smaller bubbles "fine bubble" as opposed to "coarse bubble" has a far greater surface area.
- The Bio-Bubble will significantly reduce the amount of sludge, there is no primary sludge, as all the waste is processed (with the exception of screened grape stalks and skins) not just the liquid. The sludge is composted within the process reducing the sludge volume. This system does not rely on needing many tanker movements to cart surplus sludge away, falling in line with the businesses objective to not have a negative impact on the Village and neighbours.
- Treating the sludge at source and only using the necessary energy means that the Bio-Bubble Process has a greatly reduced carbon footprint when compared to alternative processes.
- By trending flows and loads which will be specific to Rathfinny Winery the operating experience will allow optimization of the treatment plant parameters for further future savings
- Additional instrumentation to the dissolved oxygen probe such as ultra sonic level control, pH and temperature probes, mixed liquor and suspended solids probes provides the plant management information required to run the plant remotely and provide support without the need for so many visits to site keeping engineer attendance to the minimum and off the roads. Of course in the event of equipment failure one can be fore-warned well in advance of the consequence of the problem causing a much bigger issue. This releases full time staff to concentrate on making good Sussex Sparkling Wine.
- Bio Bubble being the winner of the Hampshire and Isle Of Wight Sustainable Business awards in the category of environmental technology & innovation as well as being highly commended alongside Dyson's blade hand dryer in the national energy saving awards; a wildlife sponsor dovetails us with many of the Rathfinny Estates environmental objectives; located nearby we can provide fast efficient support to the Rathfinny team.

Bio-Bubble Technologies is a pioneering company with the foresight of introducing a holistic approach for reducing the overall energy and carbon emissions of waste water treatment. Bio-Bubble installations include full-scale municipal, commercial, industrial waste water, sludge and domestic sewage treatment. Bio-Bubble Technologies is known for providing high quality, customized turn-key solutions. Our award winning process, **Advanced Aeration**, combines waste water and sludge treatment within a single reactor.

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