FP3132PH-V008-006: NON-TECHNICAL SUMMARY - October 2024

Proposed Changes

There are three proposals being put forward with this application:

1. The first proposed change is to extend the activity in 5.4 Part A(1)(b)(i) to include the operation of a Reverse Osmosis (RO) Plant and a Membrane Bio Reactor (MBR) Plant to enhance the quality of trade effluent being discharged and to allow the potential recycling and reuse of water in the factory.
2. The second proposed change is to increase the trade effluent discharge consent through W1 under 5.4 Part A from 1500m^3 per 24-hour period to 2500m^3 to take account of significant increases in production since the permit was introduced in 2005 and future proof planned developments at the Maltings as well as the increase in treatment capacity at the Waste Water Treatment plant.
3. To allow the Energy Centre to discharge trade effluent to the Waste Water Treatment plant for treatment. Maximum permitted discharge to be 720m^3 in any 24-hour period. The discharge to be metered.

Proposal 1 is to add the RO & MBR plants to the permit. These have already been built, but are still having problems due to screening limitations and so will remain a back up plant for the foreseeable future.

The second proposal takes into account the fact that when the permit was first issued in 2004, production of malt was circa 58,000 tonnes and malt products circa 12,500 tonnes. Over the years this has increased to circa 90,000 tonnes of malt and circa 30,000 tonnes of malt products an overall increase in production of just over 70%. As a consequence, the volume of trade effluent being treated has also increased. The existing plant is able to treat the volumes, but in busy periods is having to recirculate cleaned trade effluent and clean it again in order to not breach the discharge consent levels.

The third proposal is to formalise what is already happening. The new Energy Centre operated by AMP exclusively supplies electricity and heat to the factory. Because of this, they were permitted to discharge to the main site lagoon increasing the loading on the Waste Water Treatment Plant.

Our Site and Business

Muntons plc at the Stowmarket Cedars Maltings site have a number of related yet distinct process activities that depend on the use of raw or processed cereals. The site has two Maltings with a combined capacity of 90,000 tonnes with an objective to increase this to 100,000 tonnes. We are also the world's largest producer of malted ingredients comprising malt extract, barley syrup, a full range of barley and wheat-based flours and flakes and an equivalent range of spray or band dried extracts, making our Stowmarket unique in Europe with regards to the product mix arising from the site.

General Impact on The Environment

The major impact of our operations on the environment is benign. In other words, neither waste stream nor operations on site are in danger of having a major impact on the environment. This is due to the nature of the process and the control and eradication safeguards we have in place. Any new operation that is to be carried out on site is assessed for risk to the environment and Best Available Techniques (BAT) used wherever possible. The following text explains the processes we use and some of the measures we have in place to protect the environment. To further emphasise our commitment to our environmental protection we achieved certification to the international ISO 14001 Environmental standard in 2005 and we are now certified to ISO 14001:2015, as well as ISO 9001:2015 and ISO 50001:2018.

Malting

Cedars Maltings is situated in the heart of East Anglia primarily because it has a rich source of malting quality barley within a reasonable distance to minimise cost and the impact of lorry movements on the environment. The east side of the UK has the most favourable climate for growing barley. Each year we purchase approximately 121,000 tonnes of barley, of which around 12,000 tonnes is used directly to make barley syrup. Approximately 40% of the barley is bought on contract from farmers with whom we have a special agreement. Growers of malting barley are aware of key terms and conditions that apply to material destined for the food chain. Great importance is placed on the correct use of agrochemicals to ensure both food safety to consumers of malt-based products and to preserve local flora and fauna.

Barley is harvested and brought into the Stowmarket site and dried prior to storage in a number of silos on site. Drying renders the grain suitable for malting and also removes the possibility of fungal growth on the grain. Grain is tested at our intake point to ensure that it can grow vigorously in the right conditions before the malting process begins. In 2016 a continuous flow drier was installed to replace the previous drier. As the barley is dried, small and broken grains, husk and dust are sieved or aspirated off. These are sold for animal feed as barley screenings. Barley is first steeped in water from boreholes on site to ensure that it has sufficient water to allow it to grow or germinate over the proceeding four days.

After two days intermittent immersion in the water the grain is cast into germination boxes. These are air conditioned to ensure that the grain grows in a cool environment. After four days the barley will have produced a few tiny rootlets and a very small chit at the other end. The chitted barley must now be dried to render it stable for storage, to develop colour and flavour and make it suitable for milling – the process is known as kilning. The malt is then screened into storage silos.

Any dust generated in transit is aspirated off prior to dispatch. The prime method of dispatch from Stowmarket is in 20 and 40-foot metal containers that are fitted with a polyethylene liner and filled with approximately 25 tonnes of malt. These containers are sent via the port of Felixstowe to many destinations around the world. Bulk malt is also dispatched in HGV to UK customers.

Food And Environmental Safety Measures

Where used, pesticides are only permitted if included on an internationally recognised list published jointly by the British Beer and Pub Association (BBPA) in conjunction with the internationally acclaimed research centre Brewing Research International (BRi). The BRi carry out strictly controlled pilot malting and brewing prior to sophisticated laboratory analysis and sensory trails to ensure that there are no deleterious effects on the process and no taints affecting the final product. These results, together with access to a worldwide database of information on the pesticides enable an informed decision to be made ensuring that any permitted chemical is safe for the consumer and the environment.

Liquid Malt and Barley Extracts

The production facility that makes Malt and Barley extracts is very similar, in the initial stages, to the brewing process. Essentially the malt or barley is milled to a fine powder (grist) and mixed with hot water. The period of mixing with water is called the mash in which natural or added enzymes convert the starch within the grain to sugar. In the normal brewing process, this sugar solution would be fermented. However, in our extraction plant the sugar solution (wort) has around 80% of the water evaporated off to create malt extract. The extract is pasteurised to make it food safe.

Varying the type of malt or barley used in the initial mash makes a wide range of extracts. Where the extract is made predominantly from barley it is usually referred to as barley syrup. If a small proportion of the grist comprises a roasted malt, the malt extract will have a darker colour and more roasted flavour. We do not produce our own roasted malts on site, but source these from another specialist production facility within the region. Malt extract is dispatched off site in many

ways from bulk road tanker through 300kg drums, 25 and 15kg small packs to 1.8kg cans destined for the homebrew market.

The malt extract we produce can also be dried to a fine powder. We have two ways of drying the extracts. Where we wish to simply dry the extract, not increase colour and preserve enzymes within the product we use a Spray Drier. This equipment creates a suspension of fine droplets that fall through a cyclone of hot air and dry into small round powder particles. It is also possible to dry the extract on a Vacuum Band Drier. This equipment allows us to mix in a variety of other nutritional ingredients and heat the mixture as it dries to modify the flavour. The dried mixture is milled into a fine powder, slightly coarser in texture than when spray dried.

Flour

There is a flour milling plant on site that can process barley, wheat or malt flours as well as roasted malt flours. The flour is generally bagged but can also be dispatched in bulk. The Malted Ingredients division has its own small batch malting facility. The majority of production through this plant is for making malt from wheat. The process is the same as described for malt production in the Malt Division text.

Wheat Flaking

For some food products, it is desirable to have malt as flakes rather than ground to a flour. The flaking plant at Stowmarket firstly treats the wheat malt with steam to soften it. The malt is then passed through a heating phase prior to rolling. The flakes produced have a rich roasted flavour and are easily processed in various food and baking industry applications.

Water Use

Because any water we use on site may end up being processed as wastewater in our treatment plant we are very keen to minimise water consumption. Two thirds of the water used, and effluent treated on site comes from the Maltings and is low in COD and BOD. The remaining one third comes from our Malted ingredients process and is high in COD and BOD. All the water on site comes from two boreholes. There have been many attempts around the world to try to re-use water during the steeping process. Muntons plc was significantly involved in the Euromalt Swan project to investigate the use of Ultra Filtration and Reverse Osmosis as a means of reusing water. The project identified that there is a compound present in the cleaned water that inhibits germination if used for steeping. Further investigation has found that in small quantities this can be addressed. As a consequence, Muntons have invested in a Membrane Bioreactor and Reverse Osmosis plants.

Waste Water Treatment

We use a considerable volume of water in our process either for production or washing purposes. All our wastewater is treated on site in our state-of-the-art treatment plant. The aim of the water treatment plant is to ensure that when released to the local river the wastewater will not contain anything that would deplete the oxygen content, cause any cloudiness or introduce unacceptable levels of certain key compounds. This serves to protect the local flora or fauna. All parameters described are monitored both by ourselves and the local Environment Agency to make sure that we are operating correctly. The greatest volume of water that is treated comes from our malting operation. This water is however, very easy to treat because it has very low sugar content. The wastewater is treated with bubbled air (aerobically) and settlement before release to the river.

Wastewater from our malt extract and ingredients plant is of course higher in sugars due to the nature of the product. Therefore, it is treated differently, firstly without air (anaerobically) and then with air (aerobically). The combined process renders the wastewater safe for discharge. The Anaerobic effluent plant was upgraded in the period 2013-14 with a £5.5 million investment to create a plant suitable to match our rapidly expanding production facilities in Malted Ingredients.

Membrane Bio Reactor and Reverse Osmosis Plants

In seeking to increase the capacity of the Waste Water Treatment Plant from 1500m3 to 2500m3 per day a new filter system has been installed on the digestate output from the Anaerobic Plant with a view to reduce the solids loading into the aerobic sludge activated Waste Water Treatment Plant. An Ultra Filter stage has been included together with a Reverse Osmosis plant. The aim is to be able to reuse a portion of treated water on site and potentially reduce borehole abstraction, thus using raw materials (water) in a more sustainable way.

At present, the ultra-filtration plant is problematic and is a back up to the older clarifier, although as these challenges are addressed the clarifier is intended to be the back up to the ultra-filtration plant. This increases the plant capacity to in excess of 2000m3, by allowing a more dense biology growth in the bio-reactors, which allows a higher loading of water to be treated. The new Reverse Osmosis plant further processes approximately 500 m3/Day of the treated final filtered water, generally into drinking water standards water, for re-use at the site. The water will be pumped to a new local steeps water tank, sited adjacent to the existing steeps water tank for seamless process operations, to allow a blend of Reverse Osmosis and borehole water to be reused in the maltings process.

Waste Product Handling – Dust, Screening and Malt Culms

As barley is taken in, we screen off very small grains because they do not process effectively into malt. These small grains together with other small broken pieces of grain or husk are separated into dedicated screenings hoppers. This material is sold for animal feed to local businesses. Dust that is generated during the drying and screening processes is separated off by aspiration and taken via a blow line for further processing to be pelletised into animal feed. Passing the dust through cyclones removes the dust before it exits the building and cleans up the air emissions. When malt has been kilned the rootlets (culm) are removed. During movement to silo and thence to dispatch any dust generated is aspirated off. The combined dust streams from our barley intake and malt processing together with culm are pelletised on site to create a high protein animal feed.

Spent Grains

The sugar from the malt or barley is removed in the first stage of extract production, the waste grains (spent grains) are collected either for use in the preparation of animal feed or as feedstock for an AD plant.

Energy

The company is currently part of a Climate Change agreement made under the MAGB. In addition, the Stowmarket facility has a Hospital and Small emitters opt-out from the main EU-ETS scheme. The site is certified to ISO 50001:2018.

In 2021, the company contracted with a third party to build a Biomass Energy Centre on site. Land for the plant was leased to the operator who is subject to their own Environmental Permit number EPR/SP3802SZ. The new Energy Centre burns sustainably and locally sourced wood chip to generate steam for the factory. In addition, the Energy Centre encompasses a CHP plant to generate electricity for the factory making the site almost self-sufficient for energy requirements.

The 12MW biomass boiler provides steam to the site and the 2.6MW gas-fired CHP plant provides electricity modulated to the site's demands. In addition, the CHP exhaust heat goes to a waste heat boiler to provide approximately 1MWh of additional steam heat. This can also provide a 6MW back up through a secondary gas firing capability and a 6MW gas-only boiler.

The Energy Centre utilities (mains electricity, gas and water) are fed from Muntons plc and it has its own RO water treatment plant. Trade effluent is discharged through a meter to the Muntons Waste Water Treatment Plant lagoon for processing in the Aerobic plant and discharge with the final effluent.

The company has a strong commitment to improving its environmental performance, particularly with regards to energy efficiency. The Energy Centre was built by Muntons plc and Amp Clean Energy in association with Vital Energy, and is subject to its own Environmental Permit, EPR/SP3802SZ. It is located on the north west side of the site adjacent to the Norwich to London railway line and the existing Waste Water Treatment Plant. The Energy Centre is operated by Amp Clean Energy, a separate company to Muntons plc, but supplies the entire output to of the Centre to Muntons.

The renewable Energy Centre has helped Muntons plc to meet its science-based targets – to reduce emissions by 45% by 2025 (based on 2010 levels) – ahead of schedule. Muntons plc has also been able to bring forward its aspiration to reach net zero by 2050 to 2030.

The science-based targets for manufacturing are to reduce carbon emissions by 57% by 2050. Muntons plc aims to be far more ambitious and are on track to reduce emissions by 45% by 2025. It will decarbonise 100,000,000 kWh of heat demand each year – equivalent to decarbonising the heat of more than 8,000 homes per year. In addition, Muntons purchase the heat and electricity on a long-term supply agreement.

Oil Storage

With the advent of the Energy Centre, there is no longer a need to hold stocks of Gas Oil or Diesel on site. As a consequence, the oil storage tanks have been drained down and the contents disposed of safely. There is now an ongoing programme to clean and decommission the storage tanks.

Noise

None of our operations are inherently noisy. The production process areas are almost entirely enclosed. Some conveyors run overhead and outside, but noise levels are very low. However, where possible moving metal parts within the conveyors have been replaced by nylon or similar quieter materials.

Air and Odour

We have no noxious substance emission to air. Our only possible emission is dust, but all emission points are at high level and cleaned prior to release. The odours produced by kilning malt or heating wheat flakes are very pleasant, sweet cooking type odours. They cannot be detected outside the perimeter of the site. Occasional odour from the effluent plant is short lived and not of particular note because we are situated in an agricultural area where operations such as fertiliser application/muck spreading are much more noticeable. The low odour has never been detected near any of the housing areas near to site.