BORD NA MÓNA
ENVIRONMENTAL FRANCE SA

Clean Air Solutions

Installation of an Odour Abatement Unit using MÓNASHELL Technology for S.I.A.A.P.

(S.I.A.A.P. is the regional Administration for the collection and treatment of waste water from the entire Paris region)

Background

The waste water treatment plant of Noisy le Grand currently processes 30,000 m^3/day of urban effluents by a biological process (activated sludge followed by a fixed bed bio tower). The odorous emissions coming from the waste water are extracted from the pre-treatment building and sent to the biofilter, with a part of the gaseous effluents of the sludge thickener. Occasionally, the air from the building of the sludge dehydration is also treated in this biofilter (during downtimes of the sludge incinerator). The airflow to be treated is usually 16,700 m^3/h with 27,050 m^3/h on a periodic basis.

The pollutants to be degraded are mainly sulphur compounds (hydrogen sulphides and mercaptans) with some ammoniacal compounds (NH_3). The former biofilter consisted of a peat medium and whilst operating did not give satisfaction with repeated complaints from the neighbours. SIAAP therefore, decided to replace the peat biofilter with a more efficient system. In October 2003, Bord na Mona Environmental France SA submitted a tender based on their own patented MÓNASHELL technology using a medium made of shells on which the water is recirculating on a continual basis. This unique technology, installed in over 200 sites in Ireland and in the UK, was the subject of a validation by the experts of SIAAP, who have visited a number of sites in Ireland.

Bord na Mona Environmental France SA succeeded with their tender with guaranteed commitment for the performance, project deadline and guaranteed life of the medium (5 years). As it was urgent to achieve good air quality (for the residents), this installation had to be achieved within 4 months. The works started at the beginning of March 2004 (service order in February 2004) and the installation was up and running mid June 2004, with reception of the performances and the installation at the end of June 2004 (before the summer), as per the estimated schedule.

The "Syndicat Interdépartemental pour l'Assainissement de l'Agglomération Parisienne" (SIAAP), as part of its environmental policy aiming at continuously improving the reduction of the nuisance for the neighbours of their waste water treatment plants, made a call for tender in September 2003 for the rehabilitation of the existing odour treatment unit on its Marne Aval's site at Noisy le Grand (Paris suburb).

The purpose of the call for tender was *"the replacement of the peat by a mineral medium"* on this biofiltration unit. Bord na Móna Environmental France SA tendered for this project with its patented MÓNASHELL technology which uses a natural mineral shell-based medium. On being awarded the contract, Bord na Móna Environmental France SA carried out, over a 4 month period, the adaptation works of the existing unit and installed the new MÓNASHELL biofilter in order to treat 27,050 m^3/h of air extracted from the wastewater inlet works buildings and from the sludge storage tanks.

The installation was commissioned at the end of June 2004, and provides a removal efficiency of over 99% on H_2S and on mercaptans, and gives full satisfaction to SIAAP and to the residents living near the waste water treatment plant. This installation underlines the efficiency of the patented MÓNASHELL technology for odour treatment of waste water treatment plants.

Wastewater Treatment Plant of Noisy Le Grand

After isolating the former biofilter and setting up a provisional treatment of the gaseous effluents by SIAAP, the housing in reinforced concrete was emptied of its 400 m^3 of medium (peat, pebble) which was disposed in an agreed landfill site. The duckboard was also taken out, the housing cleaned and the protection of the reinforced concrete was repaired.

Concurrently, the new fittings for the MÓNASHELL process were installed:

- Reinforced concrete pumping tank placed underground
- New networks (for spraying system, electricity)
- Pumping equipment, regulation, and recirculation

The biofilter has been equipped with a new duckboard made of reinforced resin with some new supports made of concrete added.

The new media was then put in place:

- 260m^3 of MÓNASHELL shell based media specifically selected for this application

The new device for the circulation of the water with nozzles covering all the surface of the biofilter was carried out.

The pumps, the drains with their accessories, the control panels for the electrical system as well as the wires were installed at the same time.

An update of the monitoring and telometry system allowed the integration of the new system in their current installation. This MÓNASHELL biofilter was commissioned less than 3 and half months after the beginning of the works. The inoculation with specific bacteria which was undertaken by an expert allowed the biofilter to reach the guaranteed performances after only 2 weeks in operation.

The MÓNASHELL Process

The patented MÓNASHELL process has a mineral shell based media. The continuous recirculation of the water on the media ensures an excellent transfer of the pollutants from the gaseous phase to the liquid phase, even during peak concentrations. This recirculating water, with contaminants in the aqueous phase allows biological oxidation of the compounds by the microorganisms present both in the water and on the media. The pollutants are completely and naturally oxidised, without any chemical addition. The removal efficiency is very high (>99%) and the maintenance and the running costs are reduced to a minimum.

The mineral nature of the media ensures that optimal pH levels for bacterial activity are maintained. The shape of the shells provides an aerodynamic media with good water retention and low differential pressure. With continuous recirculation of water, optimal mass transfer of pollutants is ensured. Their excellent mechanical resistance allows up to 2.5m without any compaction with a very long media life (up to 5 years).

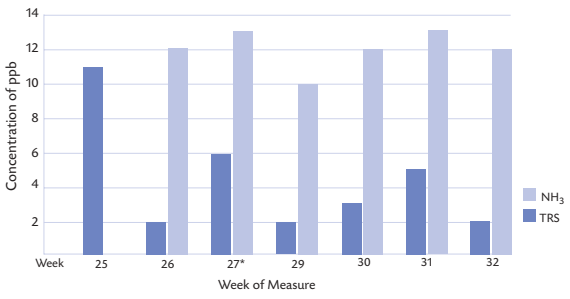
Efficiency of the Treatment

The performances guaranteed on a contractual basis are over 99% for H_2S and over 97% for the methyl-mercaptan with a maximum concentration at the inlet of 7mg/Nm^3 for H_2S and 1mg/Nm^3 for methyl-mercaptan. Bord na Móna measurements carried out over a 24 hour period with a Draeger sampler in June 2004, in order to validate the performances, gave the following results:

H_2S at the inlet of the biofilter:	up to 3,5 ppm (4,9 mg/Nm^3)
R-SH at the inlet of the biofilter:	up to 0,1 ppm (0,2 mg/Nm^3)
All the values at the outlet were below detection limit	

Since the commissioning of the MÓNASHELL biofilter, all odours have been eliminated resulting in no complaints from the neighbours. The staff has also noticed a spectacular improvement of the air quality compared to the previous odour treatment system. SIAAP has undertaken a continuous analysis for 7 weeks in June 2004. They analysed the concentration of ammonia and Total Reduced Sulphur at the outlet of the MÓNASHELL with their mobile laboratory. The concentration, at the outlet, was very low with less than 6 ppb on TRS (for all the test period) and less than 13 ppb regarding the ammonia.

Average concentration of Total Reduced Sulphur of ammonia (in ppb) measured at the outlet of the MÓNASHELL



All the results demonstrate the efficiency of the Bord na Móna process. The report made by SIAAP concluded the good working condition and compliance with the performances required. The relevant department of SIAAP has accepted this installation without any restrictions and has issued a certificate of proficiency of the compliance with the commitments undertaken (time limit, price, performances, quality, etc). They are very satisfied with the results achieved by this new technology in France for odour treatment of waste water treatment plants.

Bord na Móna professionalism for Turnkey Project

Bord na Móna Environmental France SA demonstrated with this project for SIAAP, the most important WWTP syndicate in France, its ability to carry out new units of odour abatement.

Benefits:

The benefits of the MÓNASHELL technology and its performances have been highlighted in this project profile. This technology, already patented for many years and the leading technology in Ireland and in the UK for waste water treatment plants, has now a remarkable reference site in France.

- The MÓNASHELL process has the advantage of being "clean" compared to chemical scrubbers and is a good orientation towards sustainable development.
- The gaseous pollutants are degraded by the micro organisms (biological oxidisation). There is no transfer of pollution.
- The MÓNASHELL biofilter does not use any kind of chemicals (for example for the oxidation or as a nutritive complement for the micro organisms).
- The running and maintenance costs are limited (no chemicals, low power consumption)
- The packing of the biofilter is made of a natural mineral medium (by-product of food-processing).
- There are no hazards for the staff working in the waste water treatment plant.
- A large majority of wastewater treatment plants use chemical scrubbing to treat odorous gaseous effluents. The MÓNASHELL process offers a genuinely more economical alternative and more environmentally friendly technology.

The Bord na Móna Environmental France SA's team of experts are on hand to carry out future projects using the tried and tested patented MÓNASHELL technology using the same professionalism as underlined in this SIAAP project in Noisy le Grand.underlined in this SIAAP project in Noisy le Grand.

Contact us for more details or visit our website on **www.bnm.ie/environmental**

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