



## HEALTH, SAFETY & ENVIRONMENT REPORT 2009

### Wyke, UK

The Wyke plant produces phenoxy and butyric herbicides and fine chemicals

#### The plant

Manufactures phenoxy and butyric herbicides and fine chemicals from a 27-acre site in Wyke, West Yorkshire. The site has been involved in the manufacture and distribution of chemicals since 1876, and employs 330 people. Prior to the establishment of a chemical works, a colliery occupied the northeast corner of the site. It is believed two coal seams were worked from the pit. The original chemical company changed its name to A H Marks in 1917. Nufarm acquired A H Marks in March 2008. Following the acquisition, the UK Competition Commission has placed restrictions on the integration of the site into Nufarm – this has hindered some of the actions that Nufarm has wanted to do on safety and environmental issues. The restrictions have continued throughout 2008 into 2009.

The Company operates a fully integrated Health, Safety, Environmental and Quality Management System and is registered to BS EN ISO14001:2004 and BS EN ISO 9001:2000 Standards. This means that the Company is not only audited externally by regulatory bodies and insurance companies, but all its operations, systems and procedures are independently verified by the British Standard Institute. The Company also has a specific commitment to the *Responsible Care*® programme established by the UK Chemical Industries Association, operates to Good Laboratory Practice and is compliant with the Investors in People certification.



Extract from an old map of the mine

#### Wastes

In carrying out chemical synthesis, there is the inevitable generation of by-products, which must be removed from our products before they are sold. Some of these, in concentrated form, are sent for incineration to ensure that they are destroyed. Others are contained in wash waters - these are treated on site to remove the bulk of organic impurities which are then also treated by being incinerated. Some of the by-products are organic in nature, and readily destroyed by bacterial action. These wastes are sent to a large tertiary sewage treatment plant, where they are destroyed. Some of the wastes are inorganic in nature, such as salt. While these are not destroyed by sewage treatment, they pass through the treatment process and are released into the environment, as are the same materials that are released from domestic sewage.

Regulated solids are lightly contaminated materials such as packaging, which can be landfilled. Those materials, whose values can be recovered, are sent for recovery or recycling. We continue to work on minimising wastes by working on process efficiencies.

Wastes, 2008	Tonne
Herbicides	20.5
Organics, chlorinated	2,520
Organics, non chlorinated	3,475
Inorganics	536
Regulated solids	241
Clean solids	178
Drums	33.5
Salt	10,240
<b>Total</b>	<b>17,244</b>

Destination	Tonne
Incineration	2,623
Landfill	672
Recycle/recovery	233
Sewage treatment	3,473



Aerial view of the site

#### Health and safety performance

Over the last 5 years significant improvements in the HSE performance has been seen. A great number of initiatives have been undertaken to achieve this improvement, and these have been a combination of engineering, systems, procedures and training. On reviewing the accident trends, it became apparent that the accident frequency rates had become relatively static. The accident analysis identified that one of the key areas that needed to be addressed was “human factors”. Following the acquisition, it was found that this was a major topic within Nufarm, and the work already started was quickly embraced and resources made available to implement a number of initiatives. These included:

- Take 5 and Remember Charlie
- Introduction of UIR cards
- Distribution of safety posters
- Accident / incident investigation refresher training
- Development of the trained safety representatives
- Introduction of a monthly “Recognition of a Significant Safety Achievement” award. This was developed on one shift and has since been adopted across the site. The award is to recognise good practice, rather than focussing on the negatives that tends to happen with audits and UIR reporting.

Training has also increased with people trained to be manual handling trainers and VDU assessors, and there has been a reintroduction of annual medicals.

In addition, there have been changes in how accidents/incidents are reported and we now collate information on lost time injuries of greater than one day’s duration, not just over three day injuries, categorise to include medical treatment injuries and include contractor working hours. Improvements are being seen, and work will continue to ensure that this progress is maintained.

The table records statistics expressed as per the Nufarm standards for the period March - December 2008

<b>LTIFR</b> Injuries that caused one day or more of absence per million hours worked	4.21
<b>MTIFR</b> Injuries that caused loss of time plus those that required professional medical treatment per million hours worked	5.61
<b>Severity</b> Number of days lost due to injury per 1,000 hours worked	0.036

## Expenditure

The main capital expenditure on safety was associated with a review of the fire and toxic gas systems on site, in preparation for a needed redesign and upgrade. There was a number of other, more minor, projects on immediate safety concerns. Trials were carried out on methods to increase the efficiency of the site's effluent treatment

	£A
Capital, safety	476,908
Safety training	102,521
People and safety equipment	243,697
General safety costs	1,470,000
Workplace monitoring	11,227
Rehabilitation	36,403
Capital, environment	76,504
Internal monitoring costs, envt	13,721
External, monitoring costs, envt	3,309
Environmental licences	100,840
Other environmental expenditure	113,445
<b>Total</b>	<b>2,648,876</b>

## Environmental monitoring

Environmental parameters need to be measured so that the site can operate without causing damage to the environment. A total of 1,279 parameters were measured during the year, including air emissions, effluent control, groundwater etc, with 100% compliance with the testing regime and no breaches of consent to any of the parameters set.

## Energy use

The predominant use of energy on site is for synthesis of herbicides and industrial chemicals. Some formulations are produced, but these consume relatively little energy.

All of our electricity, and most of the steam, is generated in an on-site CHP (Combined, Heat & Power) Plant. A small amount of surplus electricity is sold to the public grid. At times, oil may also be used as a supplementary fuel to ensure continuity of supply. Our estimate of carbon dioxide released in

	tonne CO <sub>2</sub>
CHP	33,297
Oil	634
Diesel	597
<b>Total</b>	<b>34,527</b>
Electricity sold	-327
<b>Total CO<sub>2</sub> released</b>	<b>34,201</b>

calendar 2008 to atmosphere is in the table.

## Personal safety

Within the hierarchy of control measures used in Health and Safety, the use of personal protective equipment (PPE) is usually seen as a "last resort". There are occasions when it is still needed so it is essential that it is selected correctly and used correctly. One piece of PPE that can be used for certain tasks is a face mask. This could be a full face mask, a half face mask or what people would refer to as a dust mask. Once the correct mask is selected, it is necessary to ensure that it is properly fitted. The photo below shows fit testing being done in our HS&E section.



## Water use

Being involved principally in synthesis, the site uses substantial amounts of water. Major uses are in synthesis, cooling, purification and effluent as well as steam.

The site used 329 ML of water in 2008.

Process improvement is a continual programme on site, the benefits of which are reduced cycle times, raw material usage, better quality, etc but often-huge benefits are seen in waste and water reduction. Some of the successful water minimisation projects are listed below:

A new decontamination / water re-use programme was adopted in the Solutions Plant in the last quarter of 2008, saving 215 tonne of water up to the year-end.

Recycling of the wash water in the ester process means that 570 tonne less wash water and 570 tonne less effluent is produced each year.

Approximately 50% of the water, in the form of condensate, is recycled back to the boiler house.

## Community

The site sponsors an award for "Best Final Honours Student" at Bradford University, Chemical and Forensic Sciences. This year the prize was for 'Outstanding Performance in the Study of Chemistry and the Pharmaceutical & Forensic Sciences' and was won by Miss Katharine Waterhouse. The award was presented in July by Dr. Stephen Heaton, and comprised of a certificate and a cheque for £100.

Regular work experience students come to the site, in 2008 as follows:

- Jan 08 – 2 pupils from Tong High School spent two weeks in the laboratory (analytical)
- June 08 – 1 pupil from Greenhead College spent a week in the Lab.
- June 08 – 2 pupils from Heckmondwike Grammar school spent 1 week in the lab.
- July 08 – 1 pupil from St. Bedes Catholic Grammar School spent 2 weeks in the offices.

Since 2006, the Wyke site has been participating in a scheme entitled Children Challenging Industry. The scheme aims are to 'improve primary school children's perception of the chemical industry and its relationship with science' and generate opportunities for teachers to provide classroom based training of the National Curriculum for Science. The program has been developed from a joint initiative by the University of York and the Chemical Industries Association.

For the site and our employees it means that, on average, we have two visits per calendar year of children from local primary schools. Approximately, 30 children, aged 10/11 arrive on each visit. In preparation various members of staff provide some basic information on their departments, such as Quality Control, Warehousing, Filling Lines and the Manufacturing Plants. Tour guides are briefed and the group of children plus teachers / support staff are first welcomed onto site, provided with some basic health and safety advice (an induction) and then divided into 3 groups so they can make their way round the site to learn about the fundamentals about chemistry and also how business works. Many of the staff prepare quizzes for the children and let them take part in analytical experiments to increase their enjoyment of the experience. Many staff find the involvement in the site tours a really rewarding experience as well as helping to provide the children with a positive insight of the local chemical manufacturing site. Who knows, future Site Managers may have experienced life on the plant as part of the Children Challenging Industry initiative.

The UK Operations Manager has been a council member (director) of the CIA for the last six years, working on strategy and issue groups for the CIA with the Competent authorities such as the HSE and EA.

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