Summary

The Integrated Pollution Prevention and Control (IPPC) Directive aims to reduce pollution from industrial activity by controlling emissions (Environment Agency 2005'). Indoor pig keepers with more than 2000 finishing pig places (above 30kg) or 750 sow places at a site, are required to obtain a permit from the Environment Agency (EA) with an annual renewal charge.

The Directive, implemented through national regulation, requires permitted sites to adopt minimum standards of management practise and Best Available Techniques (BAT) for their production processes; this involves keeping records and regularly reviewing the use of raw material materials, inputs such as animal feed, water and electricity, as well as emissions produced. (Environment Agency 2005').

Interpretation of the regulations with guidance is contained in the Environment Agency (EA) document ‘IPPC Intensive farming, How to Comply’ (Environment Agency 2005'). Permit applications will need to demonstrate compliance with these rules, and where this is not possible an Improvement Plan will have to be agreed between the applicant and regulator. Technical support and training is available to both producers and allied industries from the EA, Meat and Livestock Commission (MLC) trade bodies and consultants

Since IPPC presents additional cost burdens, and very few apparent financial gains, some producers will adjust their business to fall below the threshold, or cease production altogether, despite work by industry representatives to minimise the impact.
Introduction

The Integrated Pollution Prevention and Control (IPPC) Directive aims at achieving integrated prevention and control of pollution arising from about 45,000 large industrial installations across the European Union (EU) 15 through a system of permitting.

This involves determining the appropriate controls to protect the environment by minimising the most significant emissions to water, air and soil, as well as other environmental impacts. To gain a permit, Operators will have to show that:

- they have developed proposals to apply the “Best Available Techniques” (BAT) (and certain other requirements), taking account of relevant local factors
- that no significant pollution is caused by the activity being performed.

The essence of BAT is that the selection of techniques to protect the environment should achieve an appropriate balance between realising environmental benefits, and the costs incurred by operators.

Intensive agriculture is one activity listed within the directive and the last UK sector to have the regulation applied; others include waste disposal by landfill, tanneries and animal carcass disposal, production and processing of metals, and manufacturing organic chemicals.

In the UK, the IPPC Directive is implemented through the English and Welsh, Scottish and Northern Irish versions of the Pollution, Prevention and Control (PPC) Regulations.

The thresholds at or above which an operator must apply for a permit are;

- 750 sows
- 2,000 finishing pig places over 30kg liveweight.
- 40,000 poultry (includes chickens, layers, pullets, turkeys, ducks and guinea fowl).
The IPPC Directive (European Commission 1996) has applied to new installations within the European Union since 30 October 1999. For existing installations, the final deadline to achieve full compliance with the Directive is 30 October 2007, with applications being accepted between 1 November 2006 and 31 January 2007. If an installation is subject to a “substantial change” before that date, a permit will be required immediately.

The Environment Agency (EA) in England and Wales, the Scottish Environmental Protection Agency (SEPA) in Scotland and the Environment and Heritage Service (EHS) in Northern Ireland are the Competent Authorities responsible for issuing permits and monitoring compliance. The EA anticipates issuing some 4,160 permits, with intensive farming being the largest single sector with an estimated 1,510 permits. It is expected that the number of permitted pig farms will not exceed 350. By the end of October 2005, 16 poultry farms are permitted in England, and one pig farm permit is pending.

A series of fees exist for all PPC activity, and despite farming benefiting from a simplified scheme and lower levels compared to other sectors, they will still represent a significant additional operating cost for farmers. At the present time, the Standard Farm application fee is £3,240, the annual small standard farm (i.e. with less than ten times the threshold number of animals) subsistence fee is £2,168, and to vary, transfer or surrender a permit the fee is £330 on each occasion (Environment Agency 2005). These charges are increasing annually in line with inflation, minus any efficiency savings made by the EA. In simple terms, a pig farmer with 2,200 pig places, finishing 5500 pigs per year, will have an annual permit charge of approximately 0.5p per kilogramme pig meat, liveweight when applied to all pigs produced. Compliance costs will be site specific and no definitive costs are available, but could add up to two, three or more times again.

When the cost of implementing BAT is added, then producers are faced with a commercial decision with several choices: to continue production and absorb
the costs, to increase numbers and spread the cost, to reduce numbers to below 2000 places or to cease production completely. It is feared that many in the industry will opt for one of the last two options leading to a decrease in pig numbers.

No reliable figures exist to indicate the overall cost to the industry of IPPC or for the cost benefits to producers from improved production efficiency through better use of resources. The reduction of environmental pollution however, which the Directive strives to achieve, is anticipated to result in cost benefits to the population as a whole, associated with the reduced damage to habitats, soil and water. These however remain unquantified.

A dilemma facing many pig farmers is deciding whether their pig units fall within the requirement for a permit, and if they have more than one site, how many individual permits need to be obtained. The formal definition of “installation” is contained in Regulation 2(1) of the PPC Regs (HMSO 2000). Applying this to agriculture poses some interesting challenges and care was required to ensure that a definition did not result in a negative result for the sector, e.g. more applications and higher costs than necessary.

The EA have therefore defined an “installation” as follows;

"Where a collection of rearing places for livestock is within a 1.5km range on the same site and controlled by the same operator, and the number of places in total exceeds the threshold in Schedule 1 then this will be ONE prescribed activity and ONE stationary technical unit.

Directly Associated Activities will include such activities as central feed storage, feed mixing facilities, and litter/slurry storage and handling systems that are connected to the listed activity by fixed systems or wheeled transport.”
This definition will lead to the inclusion of some units which the operator would previously have considered outside of the thresholds, for example where pigs are finished on two sites, each site falling below the 2000 place threshold, but when combined exceeding it. For many the more significant implication will be the inclusion of other associated activities, where the principle purpose is to serve the pig production process and the requirement for BAT to be applied.

BAT has been agreed Europe-wide, and BAT Reference Notes (European Commission 2003), known as BREF’s, contain details of acceptable systems, estimated emission savings and costs.

**Implementation**

A set of rules derived from the EC Directive and UK Legislation have been developed by the EA in consultation with industry representatives, through a main steering group, sub-groups and formal public consultation.

The way in which the Rules are presented has evolved and changed with time. The latest consultation draft was released in November 2005, IPPC: Intensive Farming, How to Comply, Guidance for intensive pig and poultry farmers Environment Agency (2005\(^1\)), this closely resembles the final version which is due to be issued during summer 2006.

A series of EA Guidance Notes cover specific topics such as noise and odour, in greater detail where this is required.

“How to Comply” presents the (Higher Level) Rules to which a permit holder must adhere, and suggests how each rule may be complied with on the farm. The Rules will form the Permit Conditions that appear on the actual Permit document, these have been standardised to ensure consistency between permits and to ensure that they can be legally enforced.
For example, the rule on the selection and use of pig feed is presented as follows (abridged).

### 6.1 Selection and use of pig feed

6.1.1 The Operator shall take appropriate measures to provide a diet which minimises the excretion of:
- nitrogen; and
- phosphorus.

How can I meet the requirements of this rule?
The aim of the rule is to optimise protein use so that nitrogen excretion is minimised. The nitrogen excreted as a result of excess protein contributes to ammonia emissions to air and to nitrogen rich manure or slurry. The excretion of phosphorus should also be minimised.

You should discuss the formulation of the diet with a nutritional advisor or supplier to ensure that the minimum dietary requirements of the animals are being met.

**Appropriate measures**

The following are the appropriate measures that you should take to comply with the condition. For **existing sites** these appropriate measures should be in place no later than **twelve months** from the issue of the permit and represent what we would expect to find when inspecting the farm.

**Nitrogen**
- A minimum of two diets should be available for all pigs over the production cycle.
- For sows:
  - for the majority of the period between weaning and farrowing, the diet should be formulated to meet the nutritional requirements of the dry sow;

(Source; IPPC How to Comply, Consultation draft, Nov 2005, Environment Agency)

The Rules in “How to Comply” are divided into 8 sections;

1. **Introduction;** provides the background, regulatory approach, and implementation process.
2. Management; covers the general management of the Installation, these are a series of best practice measures aimed at minimising environmental impact through correct selection and efficient utilisation of resources. They involve the recording of raw materials, energy and waste data and the need for periodic reviews (audits). Many operators will already be practising these measures as part of their own management process or in conjunction with an Assurance Scheme. When correctly implemented these measures do enable farmers to control costs through, for example through the identification of water leaks and wastage, and the selection of more energy efficient equipment.

This section of the Rules also contains one of the key elements of IPPC, the Accident Plan, previously known as the Emergency Plan. This details the procedures which should be followed should an accident occur which could give rise to environmental damage, such as spillage of slurry or oil, drainage of water from fire fighting, and disposal of carcasses following disease outbreak. It does not cover health and safety related accidents such as accidental self-injection or broken limbs.

3. Operations; covers site condition and livestock numbers. Pig units are covered by the Pig (Records, Identification and movement) Order 1995 (PRIMO), so it is unlikely that additional work will be required in order to comply with this section of the Rules.

IPPC strives to ensure that there are no long-term environmental implications from the permitted activity, in this case pig keeping. To obtain a permit a Site Condition Report must be provided. This report will indicate residual pollution or potential pollutants from current and past activity that are present within the site boundary. It is important that this is prepared with care, as before a Permit can be successfully surrendered, the site must be returned to at least the same condition as the time of permit issue. Thus if asbestos cement sheeting has been buried on site, this should be made known at the time of application, otherwise if still present at the time of surrender, it will have to be disposed of safely by the operator at possibly considerable cost. Despite
initial concern that existing buildings with asbestos cement sheeting would have to be removed at the time of surrender, even if serviceable, these buildings can remain, providing that they are still standing.

A Site surrender Report has to be prepared, detailing how residual pollutants will be removed and confirming that any pollution events that took place during the life of the Permit present no long-term risk.

4. Emissions and monitoring; these deal with emissions to water, air and land. Where chemicals are disposed to land covered by a Ground Water Authorisation, or where emissions are released to air from an incinerator approved by the State Veterinary Service (SVS), these remain outside of IPPC, although documents to confirm this may be requested.

The application has to demonstrate that all slurries and heavily contaminated surface water is contained, and that there is adequate storage provision., as well as that lightly contaminated water is treated before discharge and uncontaminated rainfall is kept separate and discharged to surface or ground waters.

Sites with a history of odour or noise complaints, and those within 400 metres of residential housing or other “sensitive receptors” are required to submit impact assessments and management plans to deal with these.

5. Information; specifies recording, reporting and notification of changes to procedures.

6. Pig rearing; a set of rules has been specifically devised for pig production. Crude protein levels have to be consistent with the growth or production stage of the pigs to minimise loss through excretion. No specific protein content levels are stated in the Rules, this allows flexibility for future advances in feed technology and genetics. Evidence is required to demonstrate that the rule is being complied with.
Housing design and management is divided into ‘new’ and ‘existing’. New housing must be designed and managed to minimise emissions from that system. No specific system, such as fully slatted, is prohibited, but the design will need to be meet with BAT. Details of systems considered as BAT are contained in the Appendices; many of these are not typical of UK housing or proven in this country.

**A2.2.3 Farrowing pen with part or fully-slatted iron or plastic floor with a manure pan underneath (BREF 4.6.2.4)**

![Fully-slatted floor with manure pan](image)

(Source IPPC Intensive Farming, How to comply, Appendix 2 – examples of pig housing designs from the BREF. Consultation Draft November 2005)

It is important that prior to any new build, the design is agreed with the EA. Initially there may be considerable discussion over design detail until standard patterns are established. It is important that this does not hold back investment or innovation.

For existing buildings, an improvement plan has to be agreed with the Regulator. This must specify when upgrades will take place to achieve BAT. It is recognised that in some instances it will be more beneficial to replace than to improve. In these cases the existing building could be deemed as achieving BAT at a “Local Level” and allowed to reach its natural end of life point, continuing beyond that date without modification however may not be an option.
It is hoped that buildings achieving BAT will provide the pig with a healthy environment, leading to good production efficiencies, and an improved return to the operator.

Slurry and manure storage is an area where many farmers will have to make investments, some of which may be considerable to comply. IPPC strives to control emissions, and there is therefore a mandatory requirement to cover new slurry stores and lagoons and within an agreed timeframe for covering existing ones. In the case of existing stores, there may be technical reasons why retrofitting a cover may not be feasible or desirable. For example, fitting a cover to a store that is not structurally strong enough may lead to premature failure presenting a different pollution risk.

Applicants will have to agree with the EA as part of their Improvement Plan the timescale for compliance, it is hoped that many older tanks will be allowed to run to their natural life-cycle end point, following which any replacement will have to comply with the new regulations. Other tanks and lagoons may have to have a floating cover of materials applied, such as expanded clay aggregate (LCA) or plastic plates. The cost of covering is significant, floating PVC sheets or tent like structures cost in the region of £30 – 40/m² to cover over a 20-year period, which is the expected life of a cover. Materials like LCA, which require a periodic top up, are expected to cost a similar amount over 20 years (Penlington, 2005).

Slurry spreading requires low-emission techniques such as dribble bars to be adopted, which on many farms will lead to the need for additional investment. However, the improved nutrient recovery resulting from more uniform application, and reduced gaseous losses may partially offset this (MAFF¹).

A hierarchy of investment to apply BAT to existing farms, is likely to be: improvement of slurry spreading equipment > improvement of housing > the covering of slurry stores.
7. Poultry Production; similar sector specific rules are applicable to poultry rearing as for pigs.

8. Appendices; these provide a protocol for manure and slurry analysis, and examples of housing designs from the BREF for both pig and poultry housing.

A rule for minimising pollution from, and accumulation of, phosphorus in the soil is still under development. The Programme of Measures under the Water Framework Directive will influence this rule.

It is expected that the Rule will limit the quantity of manures that can be applied to soils with adequate levels of available phosphorous, so that the amount applied does not exceed the crop requirement for the rotation. Many clay soils, as found in East Anglia where manures and slurries have been applied regularly, have accumulated reserves of phosphorus; this will restrict future applications of organic manures resulting in increased transport costs for producers having to travel further from the unit to find sufficient spreading land.

Applying for a Permit.

A Defra funded project carried out by ADAS, prepared a permit application for three pig units using the existing application form and guidance provided by the EA. The resultant documents were highly complex, bulky, and time consuming, demonstrating the need for a new approach.

Through the Steering Group mechanism, the MLC produced a revised application form. The new form replaced much of the descriptive content of the original with a series of site plans to build up a pictorial representation, and a series of tick box type questions designed to extract the relevant information from the applicant in an efficient manner. It is thought that the new application form will reduce the time taken to complete the process, and overall save on costs.
The Steering Group unanimously accepted the revised concept and the EA have taken it as a basis for a revised form.

A series of press articles and Fact Sheets prepared by the MLC and Steering Group representatives will help guide applicants through the initial stages of permit preparation. A number of farmers are taking the first steps in this process having attended training workshops in the Principles of IPPC, organised by the MLC and part funded through the Defra Vocational Training Scheme.

The 2006 Pig and Poultry Fair, at the National Agricultural Centre, Stoneleigh, (May 9 and 10), will have IPPC featured on a number of stands including the British Pig Executive (BPEX), Defra and EA stands. A number of regional workshop events to help farmers prepare applications will follow in the period up to the start of the application window in November 2006.

Conclusions.

IPPC implementation within the pig industry is a complex matter, with the vast range of production and management issues implicated, increased management and administration costs, and the additional investment needed to upgrade facilities and equipment to achieve BAT make it a very daunting prospect. The costs are anticipated to add at least 1.0 pence per kilogramme liveweight to the cost of finishing pig production, with some producers claiming, 4.5 pence, potentially making the enterprise unviable.

The theory of improving efficiency through improved utilisation of resources and reduced emissions is sensible, however in practice the additional cost burden is unlikely to be recouped by an industry that is unable to pass on additional costs.
It is important that pig producers and their staff fully understand how this legislation works, together with allied trades and professionals working within the industry.

Implementation of this directive is a major challenge for the industry. Many producers are already rising to the challenge and will take it in their stride, however others are going to require careful help and guidance.

By working closely with government and regulatory bodies, the industry has done much to minimize the impact of the new regulation and build bridges of understanding, which will bring rewards in the long term. Some of these rewards may also benefit other sectors, such as cattle production, if the scope of the Directive is expanded.

References


MAFF¹. Ministry of Agriculture Fisheries and Food, Managing Livestock Manures. Spreading systems for slurries and solid manures. Date unknown.