



**Consultation  
Response:  
H8 PPC  
Surrender Site  
Report  
Guidance**

**TT Environmental  
30/09/2004**

## **TT Environmental's response to open consultation on new H8 PPC Surrender Site Report Guidance**

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## Summary

Guidance on land protection within European and UK Pollution Prevention and Control legislation is reviewed. Changes in ideas on how to protect the land are described, and two types of model of land protection identified: the reactive, which is based round the principle of “polluter pays” and the proactive, which is motivated by “pollution prevention”.

The reactive model uses evidence from intrusive investigations at PPC permit entry and closure to establish whether pollution has occurred under PPC, and to characterise what substances and amounts are involved. The proactive model concentrates on preventing pollution to land in the first place, and relies on record-keeping by permit operators to show whether or not pollution has occurred during the permit.

The Environment Agency’s Land Protection Policy of 2003 tends towards the proactive model, and to an extent the H7 guidance reflects this. However, the H8 guidance tends towards the reactive model, and in its details appears to contradict some of the intentions of the Land Protection Policy.

The current H8 guidance stresses the importance of intrusive investigations at site closure, but in the author’s experience these are not necessary to prove “satisfactory state”. The EA’s recent idea of the SPMP will, in her opinion, render intrusive investigations at permit surrender obsolete. Any permit operator following BAT requirements for infrastructure will prevent contamination to land from occurring, and the SPMP contains information which will enable this to be demonstrated at closure. Consequently, if intrusive investigations at permit surrender are not needed, then there is also no need for intrusive investigations at permit entry.

The calendar of events at closure in the H8 guidance shows an intrusive investigation followed by any remediation necessary before the PPC permit is surrendered. If the site is then sold, a further investigation and remediation is likely under the Contaminated Land regime, to deal with historic pollution. This situation could be avoided by the creation of a mechanism whereby liability for pollution under PPC could be described within the Surrender Site Report, but only paid for when the site is remediated under the Contaminated Land regulations. This suggestion would remove the current tension between the PPC and Contaminated Land regulations, avoid a “double whammy” whereby sites would be remediated twice in quick succession to different clean-up standards, and would also speed up the permit surrender process greatly.

## **1 Introduction**

The purpose of this report is to discuss what the H8 guidance on PPC Surrender Site Reports is trying to achieve, and whether it will work in practice.

In order to consider this, it became clear that the H8 guidance could not be looked at in isolation, but had to be considered as part of a suite of policies and guidance on land protection for PPC as a whole.

The report will consider whether H8 (and H7 and the PPC Land Protection Policy) are doing their jobs effectively, and suggest pragmatic and proportionate ways in which they can be changed without compromising the high level of environmental protection which the IPPC directive requires.

This report is intended primarily for policymakers within the Environment Agency, and their equivalents in Scotland at SEPA.

It may be of interest to other professionals working with PPC land issues, including:

- Environment Agency technical specialists and inspectors,
- other environmental consultants, and
- environmental specialists within industry.

It may also be useful to owners and directors of businesses who come under the PPC regulations and whose sites may contain historic contamination.

## **2 Background to current PPC Soil Protection Policy and Guidance**

### **2.1 The Environmental Protection Act 1990<sup>1</sup>**

This act was the first phase of integrated pollution legislation in the UK. It dealt with pollution from heavy industry, particularly to air and water. The IPC regime was phased in during the early to mid 1990s.

The Environment Act 1995<sup>2</sup> inserted Part IIA into the Environmental Protection Act 1990, to deal with Contaminated Land. Subsequently the Contaminated Land regulations<sup>3</sup> (Statutory Instrument 2000/227) came into force on 1<sup>st</sup> April 2000. These focus on defining, identifying and remediating contaminated land, deciding who is liable for the contamination, and who should pay for remediation.

There was no explicit guidance on preventing pollution to land under IPC, and the Contaminated Land regulations (EPA part IIA) only deal with land once it has become contaminated.

## 2.2 EU Integrated Pollution Prevention and Control Directive<sup>4</sup>

The directive was issued in 1996, and is due to come into full force across the EU by 2007.

Reading the EU directive can leave one confused, as the language is quite vague, and it is difficult to know how to interpret some meanings.

There is a requirement for site condition to be assessed, but no information on whether this means buildings and infrastructure, current uses etc, or includes soil quality data.

There is also a requirement for sites to be returned to a satisfactory state, but again the directive is not explicit on whether this is simply infrastructure, or relates to land quality.

Note: Two main guiding principles are set out at the start of the directive: “polluter pays” and “pollution prevention”. However, there can be tension between these two principles.

## 2.3 The EIPPCB<sup>5</sup>

The European IPPC Bureau in Seville was set up to provide a forum for inter-country exchange of ideas on IPPC, and to set best practice standards to be adopted by all EU states. It does this by issuing BREFS, (Best available technique REference notes), which are then adopted as the model for PPC guidance. In the UK, the EA issues sector guidance notes which rely heavily on BREFs for their content.

## 2.4 European guidance on land protection

As far as the author is aware, there have been no BREFs on Site Reports, or guidance on land pollution per se issued by the EIPPCB. There is implicit guidance on land protection within some BREFs, eg in the requirements to ensure that infrastructure is functioning correctly and tested regularly (doing this will prevent pollution to land).

However, all the explicit land guidance in the UK has come from the Environment Agency or SEPA. Sometimes this guidance has been written by staff, and on other occasions it has been commissioned from external agencies or environmental consultancies.

## 2.5 Pollution Prevention and Control Act 1999<sup>6</sup>

This was “enabling legislation” – the important details are in the PPC regulations (see below).

## 2.6 PPC regulations 2000<sup>7</sup>

For the first time, Site Reports are required at permit commencement and surrender as means of describing land condition.

The requirement that sites should be returned to a satisfactory state was included in these regulations and, like the EU directive, there was no definition on what this should mean.

## 2.7 Initial PPC guidance on land: 2001 - August 2003

The initial PPC guidance on land comprised Application Site Report guidance<sup>8</sup> issued as Annex C of the IPPC Guide for A1 Applicants, issued in circa 2001; and a separate set of guidance on closure, Guidance for Operators on the requirements of Closure Site Reports in PPC Permit Surrender Applications<sup>9</sup> which was issued in July 2002. Both sets of guidance were effective immediately.

There was a requirement that all PPC sites should carry out an intrusive site investigation, with samples tested in approved laboratories, to give technical details of the land condition. This would form the site's "baseline condition".

When the site closed, there would be a second intrusive site investigation, which would give the site's "closure condition".

Any increase in pollution between the two reports would be attributed entirely to PPC operations, unless there was compelling evidence to the contrary, and the permit holder would have to remediate the land to a satisfactory state.

Using this theory of how to run land protection, polluters would be forced to pay for their contamination, so there was no perceived need for guidance on preventing pollution to land. However, there was little incentive to prevent further contamination under the permit, as people's attitudes were "I'll be gone when they find out", or "it can be paid for in the future at closure – I'll be retired"

This model was reactive rather than preventive. Although it met the IPPC directive's guiding principle of "polluter pays", it did not meet the other principle of "pollution prevention".

The old site reports were apparently based on Contaminated Land site reports as a model:

- They involved a desk based risk assessment of the likelihood of historic contamination, to give information on where samples should be taken (phase 1)
- They both assumed that intrusive investigation was going to be carried out (phase 2)
- The information from the phase 2 intrusive investigation was put into a conceptual model of the site, to give a "baseline condition" (at application) and a corresponding "closure condition" at permit surrender.

However, unlike a contaminated land report:

- there was no risk assessment of the potential pollution risk from the land to humans, plants, buildings etc (CLEA model)
- there was no phase 3 – remediation and validation

The old site reports were very technical, and could only really be produced by specialist environmental companies, because of the need for boreholes or other intrusive investigations.

There was no indication of any need to consider pollution prevention in the old application site reports.

When it came to site closure, the definition of satisfactory state appeared to be left up to individual EA inspectors to decide – there was a great deal of discussion within the EA and the environmental consultancy community about what this meant. Some people argued that this meant that land had to be returned to its original agricultural land quality, with all signs of industry removed. Others thought that it meant that any increase in pollution since the site permit was granted had to be removed.

The first set of site report guidance opened a huge can of worms, not to mention expense, for PPC applicants. It insisted that every site have an intrusive investigation at permit application and again at permit surrender. There was a presumption of guilt on the part of site occupiers, who would have been forced to accept legal liability for unidentified or poorly identified historic contamination at permit closure. It also created tension between the PPC and Contaminated Land regulations, with the prospect of massive legal arguments over who should pay for clean up.

The guidance also created problems for the Environment Agency. It was taking them far too long to issue permits, and one of the reasons was because of a backlog on assessing site reports, which were very large for historically contaminated sites.

In the end, there was one PPC permit closure in England while the old closure guidance was in force (as far as the author is aware). This was a lead works in the North East which entered PPC briefly and then closed immediately. The author has had a brief discussion with the Inspector responsible for this site. The Inspector took the view that there was no pollution to land under the brief permit period, and that any contamination should be handled under the Contaminated Land regulations. The effectiveness of the old site closure guidance was not tested.

## 2.8 Current PPC policy on land protection: August 2003 onwards<sup>10</sup>

This policy was an important step in redressing the balance of UK PPC guidance from “polluter pays” towards “pollution prevention”.

For the first time, there was an explicit definition of “satisfactory state”, which is “no further deterioration of land condition”.

The land was recognised as a receptor of pollution in its own right, (following the source-pathway-receptor model of environmental risk assessment). In the past, it has been seen as a source of pollution, eg to air or water, rather than a receptor.

There was less of a requirement for intrusive investigations on PPC sites, although this was mainly confined to sites perceived to be lower risk to the environment.

There was a new requirement that sites monitor changes on site and effects of their operations on the land during the permit lifetime, (Site Protection and Monitoring Plan) including the need to remediate any pollution to land as soon as practicable, rather than leaving it until permit surrender.

The policy works on a more proactive model of land protection than the old land policy, because it addresses the need to prevent contamination in the first place, rather than concentrating on what happens once pollution has occurred.

## 2.9 Current PPC guidance on land protection and site reports

The new application guidance was issued in August 2003, and comprises guidance document H7, with four templates for information required. Each site now has a Site Report, and an SPMP.

Application Site Report guidance (H7 series)<sup>11</sup> main points:

- It complies with the new Land Protection Policy in that not all sites need have an intrusive investigation at permit application
- The requirements for no intrusive investigation are clear and risk-based
- Where intrusive investigation is required, the baseline data to be gathered is on substances currently used on site, or likely to be used, and not the full range of historical contaminants as per the old site report or a contaminated land report
- The Site Report itself is based on desk-top study and site walkover, like a phase 1 Contaminated Land report
- As well as a risk assessment for likely locations of historic pollution (as happens in both the old site report and a contaminated land site report), there is a second risk assessment for risks to land from operations.
- The Site Report templates are written more clearly than the old guidance
- The SPMP will vary depending on whether intrusive investigations are required at permit entry or not, which helps the permitting process go through faster.
- The SPMP is a brilliant idea: by keeping an ongoing record of changes on site, you track the changes in time, and can use it to assess the likelihood of pollution at permit closure.

Surrender Site Report guidance (H8 series)<sup>12</sup> main points:

- Assumes pollution to land during the permit period is very likely
- Reference data (ie collected from soil samples) is assumed to be the best way of proving “satisfactory state”, other models are not considered – this would mean whole-site intrusive investigation at closure
- Appears to play down the use of SPMP which should act as a phase 1 for the surrender site report, showing where intrusive investigations should be made (if any) rather than whole-site
- It recognises that not all areas of site may be accessible under permit application conditions, but assumes that if there is contamination in these areas it will be from the permit period, when it could equally be historic
- If a new substance is used on site which may have been used in the past, there is an assumption that further intrusive investigations will be carried out prior to its use to establish a new baseline figure for that substance.
- If no reference data on a substance is collected at permit entry, but that substance is found at closure, the baseline is assumed to be “background concentrations”, agricultural land quality, in effect. Eg for organic chemicals, the assumed baseline is zero, unless there is an intrusive investigation at permit application to prove otherwise.
- The closure timetable assumes that PPC investigation and remediation will be carried out prior to permit surrender. However, land sales cannot take place until permit surrender. This means that there will probably have to be a separate Contaminated Land investigation after the land sale, and further clean-up (eg historic contamination) will be carried out separately.
- In some instances, the PPC clean-up (which is “absolute”) will be to a higher standard than the Contaminated Land clean up, which is risk-based dependant on the future use of the land.

## 2.10 Current PPC land guidance: a summary

The new land protection policy appears to be trying to achieve:

- Prevention of land pollution during permit period
- If pollution occurs during permit, polluter has to clear up ASAP
- If this doesn't happen, pollution should be cleared up at permit end (worst case scenario)

This would fit into the two guiding principles of PPC – pollution prevention and polluter pays. As part of this, it explicitly states that “the Agency will not normally require intrusive site investigations to be undertaken when it determines an application...”

However, the overall effect of H8 is to ensure that intrusive investigation will still be required. On historically contaminated sites, this will be primarily as a defensive measure against being held liable for contamination in place at PPC permit entry.

Looking at the different ideas on land protection:

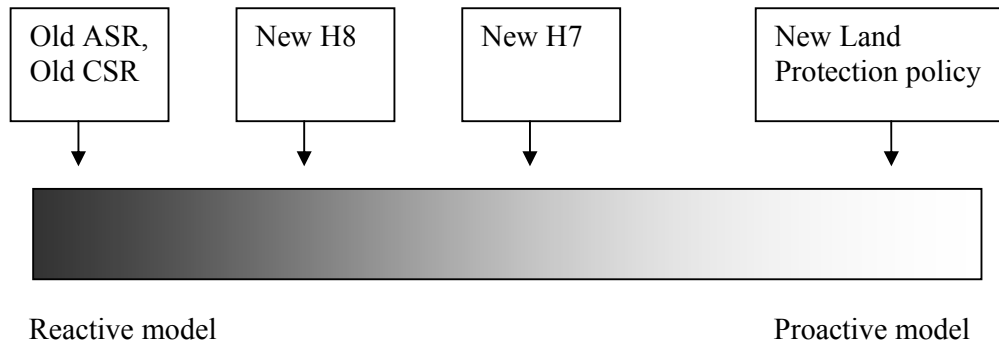
**Reactive model**

- No explicit requirement not to pollute during lifetime of permit
- No information on infrastructure condition needed
- Strict legal liability for any unidentified pollution
- Assumes you can take two baselines of contamination, and difference is explicable as new pollution
- Whole site has to be tested twice
- No requirement to clean up pollution during permit lifetime

**Proactive model**

- Explicit guidance on preventing pollution
- Containment and infrastructure testing required at application and regularly through permit lifetime– preventive maintenance
- Any pollution during permit lifetime to be cleaned up ASAP (including land pollution), and re-occurrence prevented or minimised
- Only areas of new pollution to be tested (for clean-up purposes)

**How do the various sets of policy and guidance fit into this classification?**



### **3 Current state of play: site reports**

At the moment, site reports are usually written by environmental consultants. The site report is written and submitted with the rest of the permit application. Once the permit has been granted, the SPMP takes over. On sites where there is no intrusive investigation, monitoring boreholes may be installed, or other monitoring carried out (eg watercourses). On sites where intrusive investigation is required, this has to be carried out within 6 months of the permit being granted.

The SPMP then runs through the lifetime of the permit, with operators gathering data, including monitoring data, spillages, changes in substance use, changes in infrastructure etc.

At permit surrender, we don't really know what will happen yet.

If you read H8, you might be forgiven for thinking that there will be decommissioning, then a whole-site intrusive investigation, followed by interpretation to determine the closure condition, then remediation, then validation and testing to confirm the remediation has worked. After all this, the permit would be surrendered, only to have to go through the whole process again under the Contaminated Land regulations.

However, as we shall see later, this is not necessarily the case.

### **4 What's good, and bad, about the current system**

#### **4.1 Good points**

The current system certainly makes PPC applications easier to begin with. The requirement just to have the site report prior to permit entry means that it takes less time to prepare an application, and certainly helps the Environment Agency process applications much faster.

However, much of this is pain deferred, rather than pain removed. Intrusive investigations have moved from the Site Report into the SPMP, and have a deadline of 6 months to be carried out in (which is actually quite short for a heavily contaminated site).

The SPMP is a big improvement, and should make permit closure easier despite assumptions in H8 that it won't be much use and intrusive investigations will still be required.

## 4.2 Bad points

There are numerous problems with the current system. These mainly derive from assumptions within the H8 guidance which do not stand up to scrutiny. These include the assumption that land is likely to be polluted under the PPC regulations; the idea that intrusive investigations work as a means of defining pollution over time; the assumption that you need intrusive investigations in order to prove “satisfactory state”, when you don’t; There are other problems, including that the guidance is difficult to understand; inherent conflict with the Contaminated Land regulations; and the fact that the EU directive doesn’t appear to require site reports.

### 4.2.1 The assumption that land is likely to be polluted under the PPC regulations

The H8 guidance seems to assume that businesses will pollute their land under permit, and very thorough measures must be used to make them liable for this pollution. However, this is incorrect, for a number of reasons.

#### 4.2.1.1 If you follow the BAT requirements, you are very unlikely to create pollution to land

Even if you have a heavily contaminated site, if you run under the PPC regulations properly ie following BAT and keeping an accurate SPMP, you are unlikely to cause pollution. If you do pollute, you are obliged to clean it up during the permit period, rather than wait until closure, to standards agreed with the regulators at the time.

#### 4.2.1.2 In order for pollution to take place and only to be discovered at permit surrender, there has to be a sequence of failures both within a business, and by the regulator as well

The assumption inherent in H8 that companies are very likely to pollute land is unfair to businesses, and regulators, because it implies that business are not complying with regulatory requirements (eg BAT); it assumes that (audited) management systems do not work; and also that the Environment Agency have not done their job properly by allowing such practices to go unchecked.

In the guidance, every possible opportunity is taken to assume that pollution will take place: eg that drains will only be repaired once they start to leak. In a proper preventive maintenance regime, equipment and infrastructure are repaired prior to failure, when it reaches the end of its lifetime, or there are warning signs that failure may occur. The mood in the guidance is that permit operators are lazy and unprofessional, as well as guilty of polluting the environment.

#### 4.2.1.3 Businesses want to comply with regulations

No reputable business wants to break the law: if they do so unintentionally, they will want to behave honourably and report the incident to the relevant authorities (eg HSE, Environment Agency).

4.2.1.4 Land is much less likely to be contaminated nowadays, compared to the past

Historic practices in certain industries cause land to be contaminated, but these have now been stopped. Example: chemical industry practices included chemical storage on open land (into 1980s); computerisation has helped with accurate stock control, so drums are not “lost” and allowed to rot into the ground; secondary containment is now widespread, eg bunds. Even regulator’s ideas of best practice change: at one time, chemical pipes were run in underground ducts, to protect them from frost, but this has been superseded by the use of pipe bridges and heating systems. In general, land is much less likely to be contaminated than it was 20 years ago, simply because practices have changed, and we are all more aware of our obligations.

4.2.1.5 Many businesses occupy contaminated sites which are not of their making.

There have been numerous takeovers, mergers, management buyouts etc, particularly within the chemical industry and the business occupying a site is probably not legally liable for historic contamination. (The Contaminated Land requirement for “polluter pays” could be interpreted as retrospective legislation, because it criminalises activities which were not illegal when pollution occurred).

It is the author’s opinion that a climate of mistrust is created between operators and regulators by the H8 guidance, and its effects have serious consequences.

By implying that permit holders are likely to pollute land, the H8 guidance seems likely to create tension and feelings of mutual suspicion between permit holders and regulators. This makes operators far less likely to be open and honest with the regulators, so that emissions to land (and other breaches of permit conditions) are less likely to be reported, which is bad for the environment and ultimately everybody.

There is also a more subtle message within the H8 guidance, that the Environment Agency cannot be trusted to do its job properly and ensure that operators prevent pollution during the permit lifetime. Only the apparent certainty of scientific intrusive investigations is good enough (but we will see later that this confidence in science may be misplaced).

This lack of trust in both operators and regulator also makes “proving a negative”, ie that contamination has not occurred (which should be the condition of most sites after PPC) very difficult. If you don’t trust the occupiers to keep their SPMP accurately, or the regulators to keep the permit holders honest, then you have to fall back on intrusive investigations.

4.2.2 The assumption that intrusive investigations work as a means of defining pollution over time

This assumption is incorrect. There is little or no evidence in the scientific literature that this method will work; and there are considerable technical difficulties with carrying out intrusive investigations, particularly at permit application on a working site.

#### 4.2.2.1 Little evidence in scientific literature that this method of assessing contamination will work

At a first reading of the theory of using intrusive investigations, it seems reasonable. However, it assumes that it is possible to gather two reliable datasets to make an accurate comparison. Where have the trials been carried out? There are no error measurements; no consideration of the difficulties of investigation on working sites appears to have been made. There is little consideration of the heterogeneous nature of soil, which means that contamination may not move in predictable ways, requiring much more sampling than other environmental media.

There are also incorrect assumptions in the model, including the idea (which was found in the first application site report guidance) that soil which has been sampled for testing at permit entry can be replaced in the ground, layer by layer, and then retested at permit closure. Apart from problems in physically achieving this without mixing layers together, it is highly unlikely that disturbed soil would give the same results after a year, never mind several. This is because by taking samples, you are changing the chemical and physical nature of the soil eg by introducing oxygen to the system, disturbing the soil matrix and probably causing movement of soil water (and contamination).

There is also an underlying assumption that in soil outputs = inputs. This is simply not the case, as the soil may transform contamination by chemical, physical, biological and microbiological means. It is possible, for example, that contamination can be degraded by microbes into more hazardous chemicals.

#### 4.2.2.2 Technical difficulties

These include difficulties of access to all parts of the site; that intrusive investigations may create risk to land; and many analytical difficulties.

##### Access difficulties

Under the current H8 guidance, if you don't identify pollution at the application site report, you become liable for it at permit surrender. However, many working sites have areas which cannot be accessed for intrusive investigations, under the various codes of practice (eg BS 10175) : proximity to drains; areas in tank farms, or bunds, where drilling rigs can't go; areas within buildings or under pipe bridges where drilling rigs are too tall. Some of these areas, eg near effluent drains, are those which are most likely to contain historic contamination (from leaks direct to land). By not accessing these areas, liability for historic contamination is built in to the permit for site operators.

It could be argued that future contamination is also likely from leaking drains – however the BAT documents suggest that such drains should be lined to prevent further losses, with regular replacement of the lining under preventive maintenance plans, so if a site is BAT-compliant, new pollution is unlikely to occur.

### Risks from intrusive investigations

When a contaminated site is investigated, there are a number of risks attached: gases, vapours or odours may be released; the land is vibrated, which may allow movement of contaminants, gases and water; boreholes may create pathways for contamination movement in the ground eg layer to layer, or a preferential pathway down the side of the borehole.

All these factors may result in new environmental risk being created from historic contamination, because new pathways to sensitive receptors have been created. Such risks can be contained or handled on a closed site, because there are fewer limitations on access, but are less easily dealt with on a working site.

Carrying out intrusive investigations on modern factory sites may mean disturbing sound infrastructure eg putting boreholes through reinforced concrete yard areas. Even after the concrete has been mended, it may still be weakened, or allow leaking at the seam joints. This creates a new pathway for movement of water or liquid contamination.

### Analytical difficulties

These may be summarised as: analytical problems caused when there are large numbers of substances to test for, eg masking, misinterpretation; the need to use the correct analytical techniques; problems with missing site records leading to substances not being tested for; errors due to the heterogeneity of soil, which are likely to be greater than any analytical errors between different samples, and the need for multiple samples; and problems of natural contaminants.

The analytical problems mean that it may not be possible to identify every potential polluting substance in the land, which means that a meaningful baseline may be impossible to arrive at. A fuller explanation is given in Appendix 1.

The effect of using intrusive investigations as a means of showing changes in pollution under permit makes site reports extremely expensive. Every hurdle encountered in an intrusive investigation, whether it is a difficulty in analysis, or inability to reach potentially polluted areas of the site, will cost site operators money.

This is either directly, through extra expense in analytical fees, consultant time to interpret ambiguous results, or the need for more samples to be taken and analysed; or indirectly, through not identifying historic contamination which operators will then be held liable for at permit surrender.

In order to have a valid baseline, you would need full access for drilling rigs; ideally open ground, rather than concrete; and all potential polluting substances should be easily analysable (at MCERTS labs). There should also be a full historical record of all substances ever used, so that you can be sure that you test for all substances currently in use which might be present in historic contamination. This does not sound like any factory the author has visited.

It is unlikely that an intrusive investigation on a contaminated working site can produce a valid baseline at permit entry, because it is probable that it will show less pollution than actually exists.

#### 4.2.3 Conflict between PPC and Contaminated Land regulations

##### 4.2.3.1 Two intrusive investigations at site closure

The timetable for PPC permit surrender in H8 shows that intrusive investigation and any associated remediation is to be carried out before the permit is surrendered. This means that if the land is to be sold for redevelopment, a separate contaminated land investigation will be carried out after the land sale.

It is possible that a “catch-22” situation may arise, where an operator refuses to remediate prior to permit surrender, because the land is to be sold for remediation and redevelopment, but the regulators cannot depermit until the PPC remediation has been carried out (even if it is to a higher standard than Contaminated Land), and the land can’t be sold until the permit is surrendered.

Another reason why two investigations will be required is that the reports are no longer equivalent. PPC intrusive investigations would not be sufficient to cover the requirements of the Contaminated Land regulations because they only look at part of the problem - substances currently in use - and don’t consider contaminants which are no longer used.

##### 4.2.3.2 Differing clean up requirements for PPC compared to contaminated land

Clean-up standards under the Contaminated Land regulations are variable, depending on the intended use of the land. Although recent, this system appears to be working reasonably well, and it is risk-based and proportionate.

Clean-up standards under the PPC regulations are “absolute” (assuming you can get enough data for a valid baseline at permit entry). It is possible that the clean-up standards for PPC may be far stricter than those required under Contaminated Land.

Is it sensible to clean contamination up to a higher standard than those in the Contaminated Land regulations?

There is also the issue of what happens when PPC clean –up is less than for Contaminated Land. An example could be a contaminant that is 50ppm at closure, and was 40 ppm at permit entry, but has a maximum figure of 20ppm for Contaminated Land use. Under PPC, the operator is supposed to remediate this contaminant to 40ppm. According to the H8 guidance, it would be re-remediated further at a later date. Given the difficulties in carrying out soil remediation, this does not seem very practical.

An EA Inspector remarked to the author recently that he was concerned that the H8 guidance was written in “a very litigious way”. The inherent conflict between the two sets of regulations over remediation looks likely to create legal arguments over liability for contamination.

The effect of this conflict is to vastly increase the time and cost it will take to clean up the land. It is the author’s opinion that it is in everybody’s interests that contaminated land be remediated correctly, once, rather than piecemeal and to different standards.

#### 4.2.4 The guidance is difficult to understand

The fact that the H8 guidance is difficult to understand is partly based on the complex idea at its heart: that it is possible to perform take two “snapshots” of contamination on a site over time, and use that to show new contamination which has occurred.

The author believes that it is also based on the way in which the guidance has been written, which puts many people off. It is extremely wordy and perhaps overly technical. One example of this is the difference between the old application site report and the new one – the latter, including templates being much clearer.

There are also internal contradictions between the Land Protection Policy and the H8 guidance eg the statement in the Policy that intrusive investigations will not normally be required, compared to the assumption in H8 that it is the only means of proving “satisfactory state”.

The effects of unclear guidance are that very few people understand its requirements, whether site operators, consultants or Inspectors. This means that the wrong information is included in site reports, or relevant information is left out, which can slow down the permitting process, or even create problems for site operators in future.

For example, some site operators believe that they should not fully disclose all potential contaminants in their desktop site report, for fear of being held liable for these under the Contaminated Land regulations. However, they fail to understand that instead they are creating liability for themselves at permit surrender under the PPC regime.

Curiously, this belief in not carrying out a full phase 1 was held, until very recently, within some parts of the environmental consultancy community (perhaps because they are used to obtaining information from boreholes rather than desktop investigations).

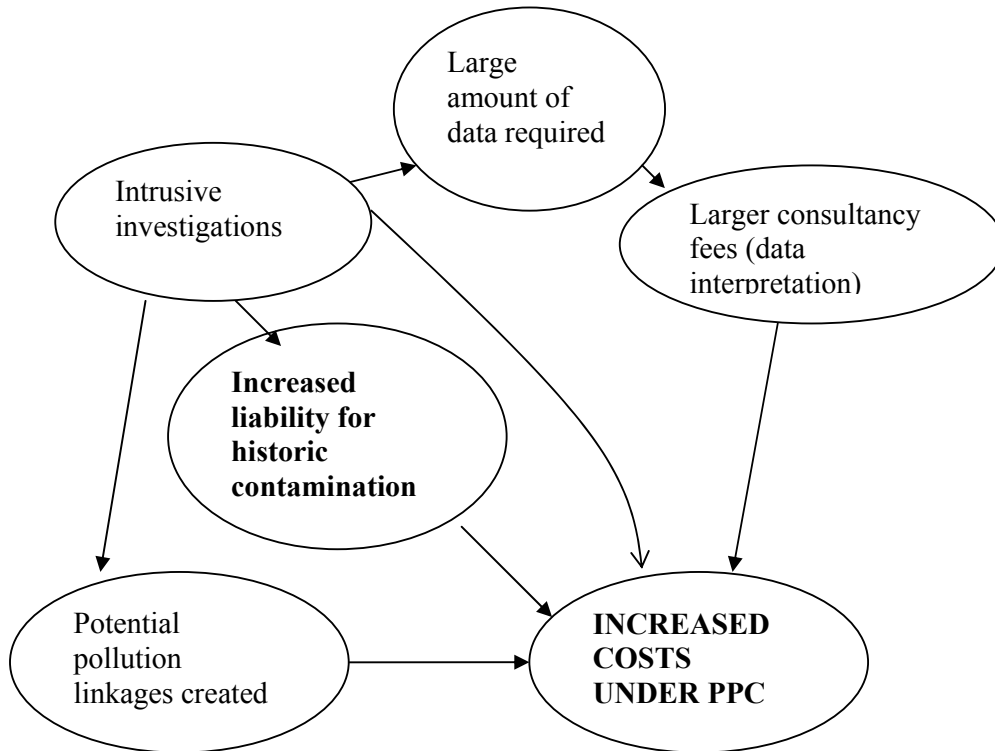
Although this model is successful for geotechnical operations, where geological maps are quite often inaccurate for local conditions, it is inadvisable for contaminated land investigations, because if you don’t know what to test for, the labs are highly unlikely to find it. Contamination is not always perceptible, there may not be any odour or discolouration to suggest that there is a problem.

Another effect is that because the guidance is quite technical, it is more likely that site operators will use external consultants, and hand over responsibility fully to them, instead of having “ownership” of land contamination issues throughout the application and permit lifetime.

The fact that the guidance is complicated and difficult to understand also means that people are reluctant to keep up to date with changes. This is not confined to site operators: the author has encountered other consultants and Agency Inspectors who, in 2004, were not aware of the changes brought about by the Land Protection Policy of August 2003.

#### 4.2.5 The costs are enormous

Intrusive investigations are expensive, directly and indirectly. A typical desk-top study and site walkover for Contaminated Land costs about £2,500. A PPC site report requires more information, eg risk assessment of new pollution potential which will involve infrastructure inspection etc, and will depend on the size of the site etc, but might be £7,000 to £10,000. Intrusive investigations are in the tens of thousands, and can run into the hundreds of thousands.



The effect of these large costs, combined with acquiring liability for some (or most) historic contamination on polluted sites is detrimental to business which fall under the PPC regulations in the UK.

Having to spend money on very expensive PPC Site Reports takes money away from pollution prevention, or investment in new products or other things which impact positively on the environment and/or the business.

It renders UK PPC businesses less competitive than others in the UK or overseas, because costs are significantly higher. This is likely to depress internal and external investment in UK industry.

#### 4.2.6 Intrusive investigations aren't needed to prove "satisfactory state"

##### 4.2.6.1 If there has been no loss of containment which would create a source-pathway-receptor linkage to land, then there can have been no new pollution.

If a site abides by BAT and keeps its SPMP accurately, it will avoid contaminating the land in the first place, so there will be no intrusive investigation. Even if the SPMP doesn't exist, it is often possible to create a record of the same information from internal records, staff interview etc and validate this against external records such as complaints to the Local Authority etc.

If there is evidence of new pollution to land, the SPMP or equivalent will locate the likely areas for investigation, and you will only dig in these areas. Using whole-site investigation is now likely only to occur in extreme circumstances:

- where there is no SPMP or equivalent sources of information,
- and there is suspicion within the EA that emissions to land are likely to have occurred;
- and that there is grounds for believing that such incidents have not been reported

The SPMP acts as a phase 1 for the Surrender Site Report, so if there is nothing in it to show any land contamination during the permit period, then the land is in a "satisfactory state" within the meaning of the PPC regulations.

This means that it is possible to "prove a negative" ie no pollution, without using intrusive investigations.

Where there is no evidence of emissions to land during the permit, it would be futile to carry out an intrusive investigation at permit surrender, because it would be looking at (some of the) historic contamination, and that is not the job of the PPC regulations.

##### 4.2.6.2 H8 guidance is effectively obsolete

It is the author's opinion that much of the current H8 guidance has been rendered obsolete by the SPMP, and that its authors have failed to appreciate how an SPMP should be used at permit surrender. Intrusive investigations at permit surrender should be exceptional under PPC, indicating that something has gone seriously wrong, and that the regulators may be at fault as well as the permit holders.

It is perfectly possible to use an SPMP to show that there have been no emissions to land during a permit's lifetime. This method has been used in Scotland successfully, by the author, and accepted as valid by SEPA. (There was no actual SPMP, but the same information was gathered from various sources eg management records, staff interviews, consulting statutory authorities etc).

#### 4.2.6.3 Intrusive investigations at permit entry are also unnecessary

If intrusive investigations are not required at PPC permit surrender, then why should they be carried out at permit entry? The purpose of intrusive investigations at permit entry is to create a baseline figure for comparison at closure, which is now not going to happen thanks to the SPMP.

Intrusive investigations then become merely a (very expensive) insurance policy against future pollution which may be created – although it bears repeating that if you follow BAT, including maintenance, land pollution is highly unlikely to occur under permit.

#### 4.2.7 The EU directive doesn't require site reports

As mentioned earlier in this report, an explicit requirement for Site Reports as a means of showing land condition under the PPC regulations appears to be unique to the UK. It is not a requirement of the directive to have Site Reports as a means of showing land condition.

There is also no BAT guidance for Site Reports. However, within BAT documents there are best practices for preventing contamination of land: eg the BAT documents on handling water have guidance on preventing contaminated rainwater entering land etc.

If, as the author believes, PPC Site Reports in this particular format are unique to the UK, and rely on intrusive investigations which are very expensive, then that means that we are at a competitive disadvantage compared to our neighbours in the EU, never mind other parts of the world.

### 4.3 Overall view of H8 guidance

The H8 guidance tries very hard to ensure that “polluter pays”, but in doing so it seems to miss the point of the EU directive, which is to prevent pollution in the first place.

The focus is on finding out who has legal liability for land contamination, but the technical difficulties involved mean that instead of an accurate description of pollution under permit, liability for historic contamination is likely to fall unfairly onto the site operators. Given that many operators are not the original polluters, this hardly seems to be getting the polluter to pay.

The level of regulation also appears to be disproportionate to the risks to land involved – if the PPC system is working properly, then pollution should be prevented.

The costs involved in using intrusive investigations to prove satisfactory state are very large indeed, yet most sites will not require this because of the SPMP, and if closure investigations are not needed, then application intrusive investigations are also unnecessary.

These intrusive investigations create an unnecessary layer of red tape and expense for industry, at a time of immense competition from overseas.

The overlap with the Contaminated Land regulations is impractical and potentially very expensive: two separate investigations and remediation at closure is an impractical idea.

It might be better to consider that “you can’t win ‘em all” –to change to a system which takes a risk that there may be some pollution to land during the permit period, but which is less burdensome for permit operators.

## **5 Recommended changes**

### **5.1 Run PPC on “pollution prevention”**

Changing the emphasis on land protection from “polluter pays” to “prevention and control” would make life easier for permit holders and regulators alike. It would also tie in with the EA’s Land Protection Policy, and with the spirit of the EU IPPC directive.

The changes recommended are: bring in the SPMP immediately; remove the requirement for intrusive investigations at permit surrender; create a mechanism for noting liability under PPC in the Surrender Site Report; handle any remediation required under the Contaminated Land regulations; remove the need for intrusive investigations at permit application; and rewrite some of the guidance.

### **5.2 Bring in the SPMP immediately, and use it properly**

#### **5.2.1 SPMP contents**

The SPMP should be used to record all relevant information: changes in pollutants (sources); changes in handling and infrastructure (pathways); and any spillages or emissions to open land or yards, buildings etc. The SPMP should also include information on how emissions to open land were cleaned up/ remediated, and prevented from re-occurring.

It should cross-refer to the site’s routine maintenance plan and records, which should require regular infrastructure inspection (and containment tests) on all major hazards to land eg all underground pipework carrying pollutants, effluent sewers, underground

storage tanks. A documented system for spills, leaks and loss of containment would be useful – it could be an incident book, or part of an EMS.

Fortunately, most chemical factories currently under PPC hold most, if not all, of the relevant data anyway in their quality and environmental management systems; an SPMP can be reconstructed, if required.

### 5.2.2 Reduce requirement for monitoring boreholes

At present, there is a requirement in the SPMP that there should be monitoring boreholes installed where intrusive investigations are not required. This is to provide defensive monitoring in cases where pollution may cross the site boundary from other businesses; and to provide an “early warning” system for containment failure.

Operators have to report their findings annually, every January. The author believes that this system is flawed, and will overload the Environment Agency with unnecessary work. Monitoring boreholes will only work under certain geological / hydrogeological conditions where water and contamination can move freely: it is unlikely to be effective on clay soils, for example. On many sites, infrastructure testing is a more reliable method of showing where leaks are, and allowing preventive maintenance or prompt repairs.

This requirement should be voluntary for any defensive monitoring, and only compulsory for those cases where infrastructure monitoring cannot be carried out by other means such as regular inspections or containment testing: ie landfills and onshore oil wells.

nb Under the Groundwater Regulations, monitoring of groundwater is only required if there are direct discharges to land.

### 5.3 Remove the need for intrusive investigations at closure under PPC

Using the SPMP to its full extent should remove the need for intrusive investigations at closure, because it will be possible to show whether a site is in a “satisfactory state”.

A Surrender Site Report might contain:

- Summary site conceptual model at Application Site Report
- Changes to infrastructure since ASR (potential pathways)
- Changes in substances used/handled (potential sources of pollution)
- Any known spillages or loss of containment
- Correspondence with statutory authorities for complaints, emissions, prosecutions etc
- Infrastructure inspection and containment testing to check that infrastructure is still sound
- New conceptual model produced – where is pollution since ASR
- Statement of land condition, if satisfactory state achieved, or a new kind statement if pollution under permit discovered (see below)

#### 5.4 Create a mechanism for noting liability under PPC in the Surrender Site Report

##### 5.4.1 Background

There is an assumption within the H8 guidance that because “polluter pays”, pollution should be cleaned up at permit surrender. However, this is not always practical, eg where a permit is transferred, or surrendered for a PPC process but the business remains in operation with non-PPC activities. It is also impractical where the site is closed and is going to be sold for redevelopment, which would mean that there would be two sets of investigation and remediation.

If a mechanism can be created to say “the permit holders liability under PPC is this”, then it would enable them to be charged for remediation at a later date.

##### 5.4.2 Mechanism type

The “handover” mechanism could be a “statement of land pollution under PPC”. It might state what, where, when, how much, why, how it can be prevented in future (if eg if the permit is being transferred). It could also say whether the contamination is negligible, or more serious, and whether there would be any impact eg on groundwater.

##### 5.4.3 Proposed sequence of events at permit surrender:

- Environment Agency is informed when operations will cease
- Operators submit decommissioning plan (including outline of how potentially polluting substances will be handled to avoid land contamination/ other emissions)
- Site is decommissioned
- Decommissioning report compiled
- Site report is drawn up (contents discussed earlier)
- Permit surrender is applied for, and internal EA consultations and other processes take place
- Inspector and technical advisors are satisfied that the site is in a satisfactory state, or that contamination under permit has been clearly identified for later remediation.
- Permit surrender granted
- Environment Agency hands site over to local authority, in regulatory terms, with copies of both site reports
- Contaminated Land regime takes over.

##### 5.4.4 How the mechanism might work to ensure polluters pay

A “Statement of land pollution under PPC” would enable permit holders to be pursued for pollution when the site was remediated. However, by leaving remediation to the Contaminated Land regulations, the PPC pollution might actually not need to be remediated, if it was below the standards required for the eventual use of the land.

Where remediation for PPC purposes is required, there might be legal disagreements between the permit holders and the new landowners consultants, because it would be in each side's interests to get the other to pay as large a percentage of the remediation. It might be useful for the EA and/or Local Authority to act as technical arbitrators between the permit holders and purchasers, or alternatively a local committee set up to cover this kind of dispute and avoid litigation.

Alternatively, a "Statement of land pollution under PPC" would enable the permit holders or site owners to sell the land to a developer with full disclosure (along with all relevant information on the site condition, particularly the PPC application site report, which should contain full disclosure of likely historic contamination as will be discussed later). If the developer believed the pollution was expensive to remediate, the price would be lowered to reflect this fact, so that the polluter would be paying by receiving a lower price for their land. (of course, this would not apply if the land was rented).

These are outline ideas on how such a mechanism might work, and the author would be grateful for any other ideas which might be useful.

#### 5.5 Handle any remediation required for PPC under the Contaminated Land regulations

PPC remediation would become part of the Contaminated Land clean-up, not a separate project, with considerable time and cost savings. It would also mean that sites would not be cleaned up to a higher standard than the Contaminated Land regulations require.

#### 5.6 Remove the need for intrusive investigations at permit application

##### 5.6.1 Reasons not to require intrusive investigations at permit application

If there is no need for intrusive investigations at permit surrender under the PPC regulations, then an intrusive investigation at permit application serves no purpose.

The author is aware that it is impossible to actually tell what contamination exists on a site until you dig into it –but if you can run a PPC permit without it, why bother?

It has been shown earlier in this report that it is unlikely that a satisfactory baseline can be described in a PPC application site report. This is another reason not to require intrusive investigations at application, because they are unlikely to fulfil their main function.

##### 5.6.2 Need for full disclosure in application site report

The trade-off for site operators in not carrying out intrusive investigations is that all the potential pollutants on a site should be identified. This means full disclosure of everything that has been used on site, or may have been used on site in the past.

### 5.7 Rewrite some of the guidance

H8 should be completely rewritten, ideally by the Environment Agency themselves rather than external consultants. The H7 guidance should be modified to take the proposed changes into account eg remove requirement for intrusive investigations, but include a requirement that relevant infrastructure (sewers, underground pipework containing pollutants, underground storage tanks) is inspected or tested prior to permit entry to prove that it is sound.

It may also be necessary to rewrite internal EA guidance documents to reflect these changes.

## 6 What would happen to site reports?

Application site reports would be compiled mainly in-house. Consultant help would only be required where technical knowledge was needed eg for geology/hydrogeology and the conceptual model. Consultants could also act as a check to ensure that all the relevant information was included.

However, it would be unlikely that consultants would be needed for writing complete site reports unless the business operators felt they were so busy they needed extra help. This is analogous to what happens in most businesses for the rest of a PPC application.

SPMPs would become a means of showing changes on site over the years. A more detailed standard format would enable firms to show what had happened to the site and land, where and when. Specialist consultancies would not generally be needed. (Borehole monitoring would only be required in specific circumstances).

At closure, site operators would carry out the decommissioning, which consultants could then confirm had taken place correctly. Consultants would be needed to compile and write the closure site report.

Even if contamination had been caused under the PPC permit, there would be no intrusive investigation or remediation at permit surrender under the PPC regulations. That would be left to the Contaminated Land regulations, although the permit holder would be held liable for any clean-up required which was attributed to the contamination caused under permit.

## **7 What's good, and bad, about the proposed system**

### 7.1 Good points

#### 7.1.1 Permit application and surrender will be quicker, easier and cheaper

Using the SPMP means that it's a lot easier to "prove a negative" ie that contamination has not taken place. It also targets where contamination may have taken place, and this information can be placed in the Surrender Site Report for use later.

It prevents a "catch-22" situation arising, and allows sites to be sold with the permit having been surrendered, but with operators still liable for remediation at a later date.

It means that permit application and surrender will be easier, cheaper and quicker, both for site operators, and the regulators.

#### 7.1.2 It gives Inspectors something to inspect

EA Inspectors should inspect infrastructure in terms of land protection eg "when did you last check this effluent drain? Was it in good repair? If not, what are you doing about it?"

Inspectors should look critically at the PPC documents kept by permit holders, including the management systems (quality, EMSs) and the SPMP. Does the system reflect reality, or is it just a nice set of documents? What happens if there's a spillage; where is it recorded, how is it tracked through the system. They could check whether the official list of potentially polluting substances match the substances being held on site. Chatting to staff informally can also help an Inspector form a view of whether the record-keeping on site is accurate.

They should also inspect the physical evidence, including looking at drains, bunds and pipework. They could be present if containment testing is required, or speak to any contractors who might carry it out.

There are many ways in which Inspectors can confirm that sites are operating to BAT standards, both for land protection and in preventing other environmental emissions, and the Regulations give them powers to have improvements carried out, if necessary. The proposed changes do rely on permit holders being open and honest, and Inspectors have a role to play in ensuring that they are.

#### 7.1.3 It's much easier to understand

The principle of pollution prevention is easier to understand than using intrusive investigations to show land contamination. Sites have to show how they're protecting the land, and the EA should inspect that they're doing what they say. This makes land protection analogous to air or water protection, rather than being a special case.

The effects of having a system which is easier to understand include that guidance can be written more clearly, and its easier to explain and educate all the participants, whether permit holders, Inspectors and consultant understand in what needs to be done.

This in turn will help foster a co-operative attitude between all parties (after all, we are all working towards a common aim of efficient environmental protection). In particular, it should encourage permit holders to compile most of the application site report themselves, retaining “ownership” of information, and helping them be committed to land protection.

It also removes a lot of the quantitative data required under the old system, which will mean that it is much easier (and cheaper) for the EA to regulate.

#### 7.1.4 It's fair

The new system works for all types of application site reports, regardless of whether there's been intrusive investigation at permit application or not. (For example, some paper mills did not have intrusive investigations carried out).

It doesn't penalise site operators who may have poor quality application site reports (eg through misunderstanding requirements of regulations, as happened initially)

It works for all types of industry (with the exception of landfill sites, which are a special case, and do require intrusive investigation at start-up to ensure the geology is suitable, and also continuous monitoring to ensure the landfill liner is intact).

#### 7.1.5 It promotes investment in pollution prevention and control

Companies will be more likely to invest in infrastructure and other pollution prevention methods, rather than pouring money into intrusive investigations (literally, a hole in the ground).

This is because they will be able to see the benefits of preventing pollution in the first place – they won't build up liability at permit surrender. Whereas under the existing system there is a feeling that there will be liability at closure, so why bother about creating new pollution.

If people understand that pollution prevention is in their own interests, they are more likely to do it.

#### 7.1.6 It removes the conflict with the Contaminated Land regulations

There would only be one set of intrusive investigations and remediation at site closure, and these will be under the Contaminated Land regulations.

There will be no risk that permit holders become liable for historic contamination which is not of their making.

The application site report should describe the historic contamination on site, and the surrender site report should describe any pollution under permit, and current conditions on site (eg building locations etc). Together, they effectively form the Phase 1 for any Contaminated Land investigations and remediation. (The PPC reports could even be placed on the Contaminated Land register).

It will mean that there is one standard for site clean-up, under the Contaminated Land regulations, rather than two conflicting standards.

#### 7.1.7 Permit transfer becomes easier

The proposed system works for permit transfer, or permit surrender where the business is still going to continue, because liability is assessed without the need to disrupt operations by having intrusive investigations.

## 7.2 Bad points

### 7.2.1 The polluter won't always pay

There will be circumstances where the PPC polluter doesn't always pay: eg where there is a small amount of pollution which is deemed negligible, or where the pollution is below the clean-up standards in the Contaminated Land regulations. However, the author believes that this would be a small price to pay compared to long-term loss of industry because of problems with the current guidance.

One of the reasons why it is in the interests of the EA (and the government) that businesses should be liable for contamination is the government funds remediation. This takes the form of a 150% tax refund on expenditure for developers. One way round this problem would be to scrap the relief, so that the taxpayer is not footing the bill.

### 7.2.2 Site reports will contain less data

Site reports will contain much less quantitative data, ie far fewer numbers. Regulators tend to like numbers, because they appear to be more trustworthy than eg descriptions. However, a lot of the quantitative data currently being produced for PPC site report purposes is unnecessary, and often of variable quality, so that the numbers are meaningless.

### 7.2.3 The system relies on the permit holders keeping accurate records

There is the possibility of cheating or dishonesty by permit holders, eg in not keeping accurate records, or failure to report emissions to land, although that is less likely with “buy-in” for the aims of the regulations. Dishonesty should also be discouraged by regular EA inspections.

## 7.3 Overview of proposed changes

The suggestions made are a radical overhaul of how land protection could be achieved under PPC. Instead of using intrusive investigations, desktop site reports and the SPMP are proposed as the means to prove “satisfactory state” at permit surrender. The other main suggestion is that liability should be assessed at PPC surrender, but that remediation should not be carried out until later under the Contaminated Land regulations.

The proposed changes are not a panacea – pollution may still occur occasionally under permit, but this system mitigates against this risk by encouraging both site operators to stop pollution from occurring, and also Inspectors to look at the infrastructure and supporting documents critically, to see if BAT being followed ie pollution is being prevented.

The benefits of the changes are that costs go down for both regulators and site operators, and the standards are not disproportionately high for demonstrating “satisfactory state” at permit surrender.

There is always the risk that the law on pollution prevention may be broken, whether inadvertently or deliberately, but the author believes that this risk is worth taking to prevent industry being placed under the heavy burden that the current system places on it.

## **8 Conclusions**

The current H8 PPC Site Surrender Report Guidance places a large burden on permit holders in the form of intrusive investigations as a means of proving “satisfactory state”. The author believes that intrusive investigations are not required at permit closure, and therefore are not needed at surrender, and describes how the existing SPMP document can be used to show satisfactory state. It should be possible to change the guidance in both H8 and H7 to incorporate these ideas without the PPC regulations having to be amended, because the changes suggested conform to the requirements of the regulations (and also the EU directive).

The second main suggestion in this report is that liability under the PPC regulations should be assessed at permit closure, but that remediation should be carried out at a later date. This idea would remove the tensions between the Contaminated Land and PPC regulations, but would probably require both sets of regulations to be amended.

This report is essentially the opinion of one person, and is likely to contain errors and inconsistencies as a result. However, the author hopes that it will help the Environment Agency reconsider the current guidance on land protection under PPC, particularly the H8 document, and make changes to ensure that the permitting and surrender process are less costly and more workable than at present.

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## **Appendix 1: Analytical difficulties for heavily contaminated sites**

Under the new land protection policy of 2003, PPC site reports are only supposed to set baselines for substances which are in use at the time of permit entry, or about to be used.

### 1. There are a lot of substances to test for

There may be many substances to test for, particularly on speciality chemical manufacturing sites, which may have hundreds of raw materials, intermediates and finished products. This is increased by potential metabolites (breakdown products in soil), by-products, naturally occurring contaminants etc.

For organic chemical sites, named products are the tip of the iceberg. Because they are based on natural sources, they are often a mixture of different chain lengths of related substances, or isomers of the same substance, and this can vary eg seasonally, or year to year.

The lab may pick up on all the isomers, but how do you set a baseline? Is it an additive amount for the isomers as a whole, or individual baselines for individual isomers?

The effects of having multiple contaminants include a greater chance of error during analysis: as there is a greater chance of masking effects, or interference between chemicals during analysis; there may be mis-identified chemicals; it is also more expensive to analyse multi-component samples, as they may need several different types of analytical technique.

A lab needs to know what to look for, so that the right test can be used. For example, not all organic chemicals dissolve in the same solvents, so using two separate solvent extractions may show up different chemicals.

### 2. Analytical difficulties

If it were easy to analyse organic chemicals, the chemical industry wouldn't spend so much time and money on QC and R & D. Sometimes, industry can't identify everything in its own products – how can external labs?

Where products unique to a site are produced, they are very unlikely to be UKAS or MCERTS accredited. This means extra time and expense for a company in creating reference standards (which may be very difficult if a high degree of purity is required); and having these accredited to MCERTS so that the baseline results will be accepted by the Environment Agency.

### 3. Inaccurate site records

It is assumed that baselines do not need to be set where a new substance is being used, because the baseline should be zero.

However, if your historic records are inaccurate, or missing, or incomplete, you may not be aware that a “new” substance has been used in the past, and so do not ask the lab to test for it. If you don’t ask the lab to test for a chemical, they won’t find it.

### 4. Inherent variability within soil

The MCERTS accreditation is meant to ensure that lab results are reliable and reproducible. However, soil is a very variable medium, which means that the error due to differences in individual samples is likely to be much greater than any error due to analysis.

Failure to take enough samples will invalidate the data, no matter how accurately the lab have carried out the analytical work.

### 5. Soil may be contaminated naturally

In some areas of the UK, the rocks contain “elevated” concentrations of Arsenic, which may be found in the soil at levels above eg the Contaminated Land standards. This may lead to problems at site closure, particularly if the baseline samples are taken from made ground (lower As) as well as natural land.

### 6. When is a substance a contaminant?

Substances may not be recognised as being contaminants – for example, copper piping carelessly discarded on open land will create contamination.

What is the situation where cinders have been laid on the ground in the past (common historic practice – cover yards and roadways with boiler ash to suppress weeds). This ash may contain eg large amounts of heavy metals and sulphides.