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Wales

Environmental Permitting Regulations (England & Wales) 2010

Regulatory Guidance Series, No RGN 8

Substantial changes in operation at installations, mining waste facilities and other facilities involving solvent and combustion

Document Owner: National Services/ Knowledge, Planning and Strategy (KSP)

Record of changes:

Version	Date	Change
1.0	March 2008	Issued for launch of EPR
Draft	December 2009	Changes arising from the Mining Waste Regulations.
2.0	April 2010	Minor editing after considering comments
3.0	March 2011	Correction of regulation reference for changes in operation regarding pre-EPR permits for activities subject to the requirements of the IPPC Directive, updates and general amendments.
4.0	March 2014	Rebrand to Natural Resources Wales
5.0	October 2014	Further reformatting

Published by:

Published by:

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1. INTRODUCTION

1.1 This note provides guidance on changes in operation (“changes which may have an effect on the environment”) - to facilities that we regulate under the Environmental Permitting (England and Wales) Regulations 2010 (the ‘Regulations’). We explain how we evaluate the significance of a proposed change in operation and whether it is a substantial change (a change in operation which may have a “significant negative effect on the environment”). This guidance does not apply to radioactive substances activities.

1.2 We require operators of all regulated facilities (apart from radioactive substances activities) with a bespoke environmental permit to notify us of changes in operation not already covered in the risk assessment for the permit.

1.3 Some facilities are subject to additional obligations if a change is “substantial”. Generally, these are changes which may have a significant negative effect on the environment. The facilities are:

- installations, where the Regulations require public consultation in the case of substantial changes - meeting the Integrated Pollution Control (IPPC) Directive;
- facilities where the Solvent Emissions Directive (SED) or Large Combustion Plant Directive (LCPD) applies; it triggers certain new plant requirements;
- mining waste facilities falling under the Mining Waste Directive (MWD). The waste management plan must be amended and we will exercise our discretion to consult in the case of substantial changes, so securing article 8 of the MWD. Additionally, a substantial change in extractive waste types (if not inert) triggers a need for a permit review.

1.4 If we consider a variation of an environmental permit is high public interest¹ we will consult and apply the substantial change charge in our Environmental Permitting Charging Scheme, if applicable (i.e. for installations).

1.5 Defra and the Welsh Assembly Government have published² guidance on change in operation and substantial change. This can be found in:

- Environment Permitting Core Guidance (the ‘Core guidance’);
- Environmental Permitting guidance The IPPC Directive Part A(1) Installations and Part A(1) Mobile Plant (the ‘Part A guidance’);

¹ See regulatory guidance EPR 6 Determinations involving sites of high public interest.

² See Defra website

- Environmental Permitting guidance The Solvents Emissions Directive (the 'SED guidance');
- Environmental Permitting guidance The Large Combustion Plant Directive (the 'LCPD guidance');
- Environmental Permitting guidance The Mining Waste Directive (the 'MWD guidance').

2. REGULATORY REQUIREMENTS

IPPC Directive

- 2.1 Article 12(1) of the IPPC Directive requires operators to notify the regulator of any “change in operation”. We are required to ensure that this is delivered through the EP permitting system. Therefore a standard condition is included in the permits of all Part A(1) installations to give effect to this requirement. We have also decided to include this condition in the permits of all other regulated facilities except radioactive substances activities and those subject to standard rules. In the case of existing permits for Part A(1) installations granted before the Regulations first came into force on 6th April 2008, an appropriate condition is deemed into all relevant permits (see regulation 108(4)). Where a proposed change in operation is the subject of an application to vary the permit, separate notification will not be required.
- 2.2 Article 12(2) of the IPPC Directive requires that where a proposed change in operation is considered to be substantial, this must be the subject of an application subject to public participation and other relevant requirements of the Directive. Under EPR all variation applications for installations which include a substantial change are subject to public participation and are required to be determined subject to all the relevant requirements of the Directive.
- 2.3 Where an operator makes an application which involves a substantial change, they must identify this on the application form. In the case of a variation initiated by us, which is considered to involve a substantial change, we must notify the operator of this fact and the charge that is due and must ensure that public participation is conducted on the proposed variation (see paragraph 8, Schedule 5 of the EP Regulations).
- 2.4 Even if we determine that an application for variation does not involve a substantial change, we may decide to exercise our discretionary power to consult on the proposed changes. This should be done when the site is one of “high public interest” (see Regulatory Guidance EPR 6: Determinations Involving Sites of High Public Interest).

Solvent Emissions and Large Combustion Plant Directives

- 2.5 Under the Solvent Emissions Directive (SED) and Large Combustion Plant Directive (LCPD), relevant existing installations or plant that undertake a substantial change as defined in the IPPC Directive have to be treated in certain respects, in the same way as new installations and plant, for the purposes of those Directives.
- 2.6 Note that under SED, where an installation is also subject to the IPPC Directive, the definition of substantial change that applies to that installation is that contained in the IPPC Directive. However, for SED installations which are not also IPPC installations, SED provides its own definitions of substantial change (see Article 2(4)).

Mining Waste Directive

- 2.7 The MWD guidance states that in the event of a substantial change to the operation or to the waste types it deals with, the operator must amend the waste management plan accordingly. And that a substantial change is a change in the operation or structure of the mining waste facility that we consider could have significant negative effects on human health or the environment (MWD Article 3 (29)). We will consult on these changes. We will include a permit condition requiring operators to notify us before making such changes to the waste management plan, so that we can assess if the risk is acceptable, additional controls are necessary and the permit needs changing.
- 2.8 The MWD guidance also requires us to review permits for mining waste facilities other than for those just for inert waste and unpolluted soil where there are substantial changes to the waste types or operations. The waste types may need adding to the permit to make them allowable and changes in waste types or operations which may have an effect on the environment will need risk assessment.

3. KEY DEFINITIONS

Change in Operation

- 3.1 Paragraph 5(5) of Schedule 5 to the Regulations defines a “change in operation” in connection with public participation for installations as:

*“a change in the nature or functioning, or an extension, of an installation which may have consequences for the environment”.*³

We use the same definition for any change to a facility where there is a requirement to notify us.

- 3.2 A change in the **nature** of an installation (facility) is a change in relation to the activities carried out in the installation (facility).
- 3.3 A change in the **functioning** of an installation (facility) is a change in how the activities are carried out (that is a change in the techniques used to carry out the activities, for example a waste management plan) or a change in the output of the installation (facility).
- 3.4 An **extension** of an installation (facility) is a physical extension affecting the capacity of the installation (facility) to carry out the activities.

Substantial Change

- 3.5 A substantial change is a change in operation of installations or mining waste facilities, which in our opinion may have significant negative effects on human beings or the environment. Certain changes are automatically regarded as substantial, namely: (a) *a change in operation of a Part A installation which in itself meets the thresholds, if any, set out in Part 2 of Schedule 1 EPR*⁴; or

(b) *a change in operation of an incineration or co-incineration plant for non-hazardous waste which would involve the incineration or co-incineration of hazardous waste*⁵;

³ Schedule 5, Paragraph 5(5) EPR

⁴ Schedule 5, Paragraph 5(5)(a) EPR, see also Schedule 13 which implements the Waste Incineration Directive (2000/76/EC)

⁵ Schedule 5, Paragraph 5(5)(b) EPR

4. WHAT IS A CHANGE IN OPERATION?

- 4.1 The operator's obligation is to operate the regulated facility in accordance with its permit conditions. Therefore, the Operator is not required to inform us about changes that we have already considered and authorised under the permitting procedure.
- 4.2 Permit applications contain a considerable body of information about the facility, the operations that are carried out there, how those operations are carried out, and the technologies and techniques that are to be used to prevent or reduce emissions. An application is essentially a proposal: "I intend to operate in this way (or these ways), to this performance level and with these effects on the environment". Within this proposal the operator may set out an anticipated range of operations, for example, different types of fuels, raw materials or wastes that may be used at different times, or the different products may be produced in a batch process facility.
- 4.3 Where a subsequent change in operation is within the scope of the permit and is not contrary to any permit conditions or waste management plan, the operator will not need to apply to vary its permit.
- 4.4 We may be content with the operator's proposals but decide not to make operation in accordance with some or all of them a specific condition of the permit. For example, if the operator were to state an intention to use a somewhat different (non-waste) fuel, it might not be necessary for us to specify that fuel in the permit. Instead the operator could be constrained by the need to comply with emission limit values (ELV), performance standards and/or other permit conditions.
- 4.5 We may not be satisfied with an operator's proposals. For example, we may need a fuller risk assessment and an application to vary the permit, leading to additional emission controls.

5. WHAT IS A SUBSTANTIAL CHANGE?

Part A(1) installations

- 5.1 The decision about whether or not a proposal entails a substantial change will be made on the basis of the application from the operator, rather than on our view of the likely outcome of the determination process. This is to ensure that any proposals that could have significant negative effects are subject to examination by the public and other consultees. For example, if an operator were to apply for a change that would have significant negative effects due to the lack of any abatement measures, this would be treated as a proposed substantial change, even though the determination might in fact require such abatement or refuse the change altogether.
- 5.2 The general definition of substantial change in paragraph 5 of Part 1 of Schedule 5 EPR states that a substantial change is a change in operation which in our opinion "may have significant negative effects on human beings or the environment". The use of the word "may" indicates that possible or potential environmental impacts can be taken into account as long as they are not too speculative.

5.3 In order to assess whether the proposal constitutes a substantial change it is necessary to determine the additional environmental impact (if any) that would be caused by the proposed change. At a small factory that might be equivalent to a very large increase in production.

5.4 Where an operator makes a number of small changes over a period of time each change should be addressed on its own merits. However, there may come a point where the combined effect of numerous small changes could have an overall significant negative impact. This is a situation in which we may opt to exercise our discretionary power to consult on a non-substantial change.

5.5 When considering what constitutes an effect on human beings or the environment, reference may be made to the definitions of “pollution” (as it applies to regulated facilities which are not water discharge or groundwater activities) and “emission” in regulation 2(1) of the Regulations and the general principles of Article 3 of the IPPC Directive.

“Pollution” means any emission as a result of human activity which may—

- (a) be harmful to human health or the quality of the environment,*
- (b) cause offence to a human sense,*
- (c) result in damage to material property, or*
- (d) impair or interfere with amenities and other legitimate uses of the environment;*

“Emission” means—

- a) in relation to a Part A installation, the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in the installation into the air, water or land,*

5.6 The ‘general principles’ of article 3 of the IPPCD, are that all preventative measures should be taken against pollution (in particular through the application of best available techniques (BAT), no significant pollution should be caused, waste production should be avoided, energy should be used efficiently, measures should be taken to prevent accidents and limit their consequences, and the site should be restored on the cessation of activities.

5.7 These definitions and principles set the parameters of the IPPC regime. As a result we take the view that it is not relevant to consider issues such as visual amenity (except as described in paragraphs A.9.1 to A.9.3 of Annex A), changes in raw materials (unless they affect emissions, waste production or accident potential), or changes in off site traffic movements.

5.8 A new Schedule 1 EPR listed activity may be added to an installation without necessarily constituting a substantial change. For example, a chemical plant might be extended by the addition of equipment to operate an additional chemical process that is a listed activity with no threshold requirement. In these circumstances the fact that a new listed

activity would be added would not be relevant to the substantial change decision, which should be based solely on the assessment of the environmental effects of the change.

Mining waste facility

- 5.9 According to Article 3 (29) of the MWD, a substantial change to a mining waste facility is a change in the operation or structure of the facility that we consider could have significant negative effects on human health or the environment. We should apply the criteria in paragraph 5.5 above.

APPENDIX A Practical tests for determining significant negative effect

Use these tests to help assess if a proposed change is substantial.

A.1 Releases of Polluting Substances

- A.1.1 A proposed change should be assessed firstly in terms of the likely environmental impact of *individual substances* released to individual media. If a significant negative effect can be identified in terms of any individual substance then the change should be deemed to be substantial. If it cannot, then the assessment should move on to consider the *overall impact* on the environment from the proposed change. If the impact of each individual substance in individual media is only small, but collectively there is an overall significant negative impact, then the proposal should be deemed to be a substantial change. Similarly, if a mixture of substances is released (e.g. landfill leachate) then consideration should be given to the impact of the mixture.

- A.1.2 Even if the overall impact of a proposal is positive, a significant negative effect on any individual medium resulting from an increase in one substance alone will be sufficient to make the proposed modification a substantial change.

- A.1.3 Several tests are set out below for specific types or consequences of releases of polluting substances. It is important to note that the tests are concerned with the actual *release*. So if, for example, a change in operation at an installation leads to increased production of a potentially polluting substance (e.g. methane in a landfill), but this substance is subsequently burned-off, the relevant tests concerned with releases should only consider the substances actually released after combustion. It is also important to note it is the impact of the change in operations that is being considered, not the change from the currently authorised limits.

A.2 Ambient concentrations of polluting substances as a result of releases

- A.2.1 The Technical Guidance Note H1, *Environmental Risk Assessment*, provides a methodology that allows the screening out of substances that are released in such small quantities that the risk of an impact could be considered insignificant. H1 compares the Process Contribution (PC) of a substance against the relevant

Environmental Quality Standards (EQSs), both EC and UK, and Environmental Assessment Levels (EALs).

A.2.2 Process contributions can be considered insignificant if:

- (i) the long term PC is <1% of the long term EQS; and
- (ii) the short term PC is <10% of the short term EQS

See H1 annexes for detail. See below for the significance criteria for some farms.

A.2.3 Conversely, a change in concentration of a substance in the environment should normally be regarded as substantial if:

- (i) it produces an increase in the PC of more than 20% of a short term EQS/EAL; or
- (ii) the Predicted Environmental Concentration (PEC) exceeds 70% of the long term EQS/EAL.

Again, see H1 for detail.

A change at an intensive livestock installation has a significant negative effect and therefore is a substantial change if the PC at a sensitive receptor (from the whole installation, not just the added part) is predicted to be over Y% of the Critical Level/Load; where Y is:

- 4% for SAC & SPA;
- 20% for SSSI; and
- 50% for other nature conservation sites.

A.2.4 For releases to controlled waters, the assessment of an impact on an EQS/EAL should be undertaken at the boundary of the designated mixing zone.

For releases to atmosphere, the assessment should be for the point of maximum ground level concentration under poor but not extreme weather conditions (e.g. the worst year in 10) that is consistent with the receptor and time-averaging properties of the EQS/EAL being considered. For example, the maximum ground level concentration will usually lie closer to the source for short-term criteria, such as the Expert Panel on Air Quality Standards (EPAQS) 15-minute standard for SO₂, than for the annual average value.

A.2.5 There may be other factors which indicate the change may have a significant negative effect, such as changes in the nature of the release; for example, the phase, size or shape of particles. Conversely, a change that qualifies as substantial under the test might be exempted if the new release accompanies a reduction of a different release with similar effects. Therefore, once the test has been applied, if it suggests a clear

outcome one way or the other consideration should be given to whether any of the additional relevant factors are likely to lead to a different decision.

A.2.6 For cases falling between the two sets of criteria given above, the overall impact of the change on an environmental medium should be considered in the light of both the number and degree of exceedences of the thresholds described in paragraph A.2.2 (i) and (ii). Decisions about such cases would be at the discretion of our officer, having regard to our guidance, when all such factors would be considered together.

A.3 *Releases of substances to groundwater*

A.3.1 For releases to groundwater (where groundwater is defined as all water that is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil), substantial change should be considered in the context of the requirements of the Groundwater Directive 2006.

A.3.2 For hazardous substances, any change that could result in the input of hazardous substances to groundwater that would not attract an exclusion under Article 6.3 of the Groundwater Directive should be considered a substantial change. So a proposal to discharge hazardous substances for the first time should be considered a substantial change, as should a change that would introduce a new hazardous substance into the discharge in anything other than trivial quantities.

A.3.3 Releases of non-hazardous pollutants to groundwater will need to be assessed for substantial changes on a case-by-case basis having regard to the general principles and guidance (including the guidance from the Government) in this document.

A.3.4 Where there has been a Groundwater Risk Assessment this may demonstrate that no input of hazardous substances to groundwater, and no pollution of groundwater by non-hazardous pollutants, will occur. If it appears to us at first glance that this is likely to be the case, then the proposed change would not be a substantial change on the basis of emissions to groundwater.

A.4 *Accumulation of substances in the environment*

A.4.1 Some releases, for example of heavy metals or persistent organic compounds such as dioxins or hexachlorobenzene, might lead to a build-up of polluting substances in the environment or bio-accumulation in the food chain. The test in paragraphs A.2.2 and A.2.3 should be applied in conjunction with suitable criteria where available, to determine whether the release should be considered substantial. Environmental accumulation should be considered over a 10-year period of operation, except in the case of heavy metals which should be considered over the whole likely lifetime of the installation (assuming a minimum of 10 years, or 30 years if the lifetime is unknown). The bio-accumulation of pollutants should be considered against the tolerable daily intake for a particular receptor, where such information is available.

- A.4.2 For releases to surface water, the above criteria should be applied at an appropriate point in the controlled water beyond the mixing zone – defined as the area (or more strictly a volume) where the exceedance of an objective is acceptable. The identification of a mixing zone is a matter of professional judgement in the light of the following factors. For running fresh waters the mixing zone is a function of effluent and river flows and the physical characteristics of the bed (weirs, roughness, gradient, width, depth, etc.). We would normally consider that the mixing zone would extend from between 6 to 100 channel-widths downstream of the point of the release. For tidal waters, relative density, depth and tidal advection and dispersion are important in defining mixing zones. In cases where accumulation from releases to water may be an issue, see H1 water annexes and consult colleagues with water quality expertise at Area/Regional or National level (depending on the significance of the discharge) on the appropriate point for the assessment.
- A.4.3 There is considerable uncertainty in assessing the build-up of pollutants in the environment or biota and it may be difficult to find appropriate criteria to properly apply the tests in paragraphs A.2.2 and A.2.3 in a robust manner. Under these circumstances, the decision would be at the discretion of our officer after taking into account the magnitude of the release, the potential for accumulation or bioaccumulation and uncertainty in the assessment.

A.5 Releases of substances where we do not have reference standards – the Precautionary Principle

- A.5.1 Where the unquantified (but more than purely hypothetical) risks to human health or the environment arising from the release of a particular substance warrant it, we will take a precautionary approach and treat any increase in releases as a substantial change. Unless the increase in releases is trivial, i.e. the quantity released is so small it could not have an impact.
- A.5.2 This approach will be applied in connection with specific substances that we identify from time to time in assessing particular cases; i.e. not generally across a sector. For example, it might occur when considering how a particular complex pharmaceutical is produced, stored, used or disposed of.

A.6 Energy Efficiency and Releases of Greenhouse Gases

- A.6.1 Energy efficiency of itself is unlikely to be an issue that would give rise to considerations of substantial change. However, releases of greenhouse gases arising from an installation (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) would need to be considered to see if the proposed modification is a substantial change. The UK Government has set a target for reductions in greenhouse gas emissions to 12.5% below 1990 levels by 2008 – 2012, and a domestic goal of reducing emissions of carbon dioxide to 20% below 1990 levels by 2010. In principle emissions of these pollutants from industrial activities should be reducing with time.

- A.6.2 It is not possible to establish the absolute environmental impact per tonne of CO₂ released since this is a global pollutant. Therefore a surrogate level at which the release should be deemed substantial is needed. 150,000 tonnes CO₂/year is suggested for this purpose. This corresponds to the approximate level of releases that would result from a coal-fired power station with a rated thermal input of 50 MW, the threshold for EPR in Schedule 1 to the Regulations. Any change that has the potential to lead to additional releases of CO₂ above this level, in any year (not just the first year after the change), should be considered substantial.
- A.6.3 For other greenhouse gases, release levels can be converted into CO₂-equivalent figures, using the 100-year global warming potential.
- A.6.4 For landfills, a consideration of the greenhouse gas releases is not necessary as an increase in capacity of more than 25,000 tonnes for a landfill or 10 tonnes per day for non-hazardous (or hazardous waste) would be treated as a substantial change. This is because the change itself would meet the Part A threshold for a landfill installation disposing of wastes that are not inert.

A.7 Releases of substances that deplete the ozone layer

- A.7.1 Depletion of stratospheric ozone is caused by chemicals containing chlorine and bromine such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), carbon tetrachloride, 1,1,1-trichloroethane, halons and methyl bromide. EU and international agreements will lead to the phasing out of these substances, with some exemptions for essential or critical uses. Any change that has the potential to lead to additional releases greater than 100 kg/year, expressed as CFC-11, should be considered substantial. This relates to any year, not just the first year after the change.

A.8 Releases of substances causing formation of ozone at low level

- A8.1 Ground level ozone is formed as a result of the interaction between sunlight, hydrocarbons and nitrogen species. The extent of ozone formation will depend on the local air quality, the exact mixture of hydrocarbons released, time of year and time of day. It can only be represented by a detailed assessment of the chemical processes involved. Modelling undertaken by the Meteorological Office can estimate the increase in ozone concentration from the release of individual hydrocarbons in an air parcel moving over Southern England. Ozone levels downwind of an industrial source are related to the hydrocarbon emission rate, the availability of hydroxyl radicals, the reactivity of the hydrocarbon and the hydrocarbon degradation mechanism. Ideally, modelling would be undertaken for the mixture of hydrocarbons released and the ozone generated compared with available environmental criteria. However, the modelling involves complex atmospheric chemistry and knowledge of the quantities of different hydrocarbons released, neither of which may be readily available. Consequently, the hydrocarbons have been grouped into a number of categories based on their Photochemical Ozone Creation Potential (POCP) values (see H1). Based on results from the modelling undertaken by the Meteorological Office, release

rates likely to give rise to ground level ozone concentrations approximately equivalent to 2% and 20% of the EPAQS standard (50ppb ozone as an 8-hour rolling average) have been calculated for representative substances in each category. These are given below.

POCP value	Release rate equivalent to 2% of EPAQS criteria (t/hr)	Release rate equivalent to 20% of EPAQS criteria (t/hr)
>100	0.3	3
<100-80	0.5	5
<80-75	0.7	7
<75-65	1.4	14
<65-60	2.6	26
<60-30	4.1	41
<30-14	5.5	55
<14 (Category B (our classification) VOCs)	12.6	126

If the change in the release rate for the substance concerned is less than that given in the second column, for 2% of the EPAQS criteria, then the change should not normally be considered as substantial. However, if the release rate is greater than that shown in the third column, which gives rise to an increase in ozone concentration of 20% of the EPAQS criteria, then the change should normally be regarded as substantial. For cases falling between the two criteria the decision is at the discretion of our officer.

A8.2 It is likely that hydrocarbons will not be released as single substances but rather in the form of mixtures. In these circumstances the proportional contribution of each hydrocarbon should be calculated for both the 2% and 20% criteria and the proportions summed across each criteria. If the total proportional contribution exceeds 1 for either the 2% or 20% criteria then the release rate of the mixture can be considered to have exceeded the particular criterion. For example, consider the release of 2 substances with POCP values of >100 and 100-80 and releases of 0.2 and 0.4 t/hr respectively.

$$\text{Relative contribution to 2\% criterion} = \frac{0.2}{0.3} + \frac{0.4}{0.5} = 1.46$$

Since this value exceeds 1 it can be assumed that the release rate of the mixture of the two substances will lead to an increase in ozone concentration of greater than 2% of the EPAQS criteria.

A.9 *Effects of releases on visual amenity*

- A.9.1 Visual amenity of the installation itself will not usually be an issue for the regulation of IPPC installations (see section 5). However, the visual effects of polluting emissions, such as the appearance of any dispersed plume, will be relevant. For example, a change to a plume that causes it to condense and severely reduce the sunlight might need to be considered. There may also be circumstances where changes could give rise to photochemical smog. The interactive effects of the new or altered plume with other plumes in the area should also be considered.
- A.9.2 Similarly, a discharge to surface waters should be assessed for substantial change. Such a discharge, for example from a dye works, food production facility, paper mill, etc., could cause a change in colour in the water on an increase in the colour concentration. This could then lead to harm to flora and fauna due to the blocking of light, or offence to human senses due to the changed appearance of the water.
- A.9.3 Where such changes do occur, it is not a question that can be solved by formula, and judgement will have to be used to determine whether any such change is substantial.

A.10 *Odours*

- A.10.1 Consideration should be given to any proposed increase in the mass release of an odorous substance that would be likely to lead to a higher level of exposure (duration, frequency and/or concentration) to odour at sensitive receptors or other defined points. Where odour is likely to be a problem, modelling of estimated odour releases (as proposed, whether with or without abatement) should be undertaken to quantify any increase in the impact in terms of predicted ground level concentrations at the receptors, compared to the current levels (used as a baseline). Worst case emissions should be modelled, as well as usual steady operation. Where emissions are made up of a mixture of odorous components, releases are usually quantified in terms of odour units. Appropriate justification should be provided where the use of a surrogate to represent the total mixture is proposed. Consideration should also be given to any change in practices or activities that might reasonably be expected to increase fugitive emissions. Occasional activities associated with the proposed changes, such as cleaning or maintenance, should also be included in the consideration, as should seasonal activities.
- A.10.2 Whether such changes are substantial will normally depend on the extent of the increase in modelled ground level concentrations in terms of potential for causing odour-related annoyance amongst exposed receptors. Where an increase might be expected to take the impact from a situation from acceptable to unacceptable, then this would normally be a substantial change. Considerations of acceptability are described in our guidance on odour.
- A.10.3 When considering existing sites, modelling results should be considered in the context of what has been experienced.

A.11 Increased likelihood or consequences of accidents

- A.11.1 As well as examining normal operational releases, testing for substantial change should also consider the hazards and risks associated with foreseeable but unplanned events that could occur. Such events could include, for example, a chemical reaction proceeding faster than planned which could lead to safety valves being lifted on reaction vessels, thus releasing polluting substances to the environment. Increases in inventories of toxic chemicals, or additional tanker loading/unloading activities, could also lead to increased accidental release hazards and risks.
- A.11.2 Similarly, changes to waste types may lead to different risks and/or hazards, such as breach of a landfill liner. The change of a landfill classification to a class of landfill with a greater hazard should be regarded as constituting a substantial change. For example, changing from a landfill for inert waste to a landfill for nonhazardous waste or changing from a landfill for non-hazardous waste to a landfill for hazardous waste should be considered a substantial change. The storage or treatment of different waste hazard categories not currently covered by the permit would be a substantial change.
- A.11.3 A good operator would plan for such matters and ensure that there will be measures in place to control environmental impacts even during unplanned events. If not, we should not be permitting them. The matter for judgement is whether the change (e.g. increase in the inventory) would itself lead to a greater risk and/or hazard associated with unplanned events. A substantial change could be triggered by an increase in accident hazards, an increase in the risk of such hazards, or both.
- A.11.4 If a proposed change would give rise to new hazards with potentially severe consequences for human health or the environment - for example leading to severe damage that would be long-lasting, widespread or irreversible - the change should normally be considered substantial regardless of the risk involved.
- A.11.5 If the consequences of a hazardous event would be less severe, yet still significant, then the risk of occurrence should be considered as well. The risk need not necessarily increase from the position before the proposed change. For example, say an intermediate compound is changed to one that is much more hazardous. Although the expected frequency of events might well stay the same (the accident risk being governed by management activity and engineering methods) the increased toxicity should be considered to assess whether the quantum of added potential harm is significant. The determining factor is the increase in the figure that results from multiplying the risk (probability) of a hazardous event by the harm that could result.

This should indicate the average total amount of additional pollutant that can be expected to be released over a given period, and its resulting environmental impact.

Normally this should be considered over the whole likely lifetime of the installation (assuming a minimum of 10 years, or 30 years if the lifetime is unknown).

A.12 Increases in production of waste

A.12.1 A proposed modification might result in an increase in waste materials for disposal or recovery. Provided that this change meets the requirements of the waste hierarchy in Article 3(c) of the IPPC directive, this is not normally likely to be a substantial change. Such disposal or recovery should be properly regulated and controlled, and therefore the net environmental impact is likely to be small in most cases. However, it must still meet the requirements of the waste hierarchy in Article 3(c). A proposal leading to a significant increase in the quantity of waste consigned for waste disposal when it was previously recovered would constitute a substantial change.

A.12.2 Changes in waste production could also lead to increased accident hazards or risks, which should be considered as described in section A.11 above.

A.13 Heat

A.13.1 Releases of heat should be considered in the same way as other pollutants, considering the effect of temperature on the environment.

A.13.2 Substantial change tests for controlled **fresh surface waters** can be derived using the maximum permissible temperatures and temperature differences, as specified in the Surface Waters (Fishlife) (Classification) Regulations 1997. These Regulations limit the temperature differences between the point downstream of a thermal discharge (at the edge of the mixing zone) and the unaffected temperature (the upstream temperature) to 3°C for cyprinid waters and 1.5°C for salmonid waters. The maximum temperature at the point downstream of a thermal discharge is 28°C for cyprinid and 21.5°C for salmonid waters (these temperature limits may be exceeded up to 2% of the time). Factors can then be applied in a manner similar to that specified above for releases of polluting substances (see paragraphs A.2.2 and A.2.3).

For example, any thermal effect that would constitute 20% or more of the allowed temperature difference, result in the temperature difference exceeding the appropriate limit or take the temperature above the permitted maximum, would be considered a substantial change.

A.13.3 Applying the above principles, for all controlled fresh surface waters except designated salmonid waters, an increment of 0.6°C (20% of 3°C) at the point downstream of the thermal discharge should normally be considered a substantial change. If the increment is less than 0.6°C but the resulting temperature difference is greater than 3°C the change should also be regarded as substantial. In addition, where the increment is less than 0.6°C consideration should be given to the resulting temperature (background + increment) at the downstream point of the thermal discharge. If this is less than 22.4°C (80% of 28°C), the change should not normally

be regarded as substantial. If it is greater than the maximum temperature limit of 28°C the change should normally be regarded as substantial.

A.13.4 For designated salmonid waters, an increment of 0.3°C (20% of 1.5°C) at the downstream point of the thermal discharge should normally be considered a substantial change. If the increment is less than 0.3°C but the resulting temperature difference is greater than 1.5°C the change should be regarded as substantial. In addition, where the increment is less than 0.3°C consideration should be given to

the resulting temperature (background + increment) at the downstream point of the thermal discharge. If this is less than 17.2°C (80% of 21.5°C), the change should not normally be regarded as substantial. If it is greater than the maximum temperature limit of 21.5°C the change should normally be regarded as substantial.

A.13.5 For any controlled fresh surface waters, if the increment is less than the relevant figure in paragraphs A.13.3 and A.13.4 (i.e. 0.3°C or 0.6°C as appropriate), and the resulting temperature lies between the relevant upper and lower figures (i.e. 17.2°C and 21.5°C for designated salmonid waters, or 22.4°C and 28°C for other controlled fresh surface waters), judgement will have to be used to determine whether any change is substantial.

A.13.6 In addition to the above, the Surface Waters (Fishlife) (Classification) Regulations 1997 contain an override limit of 10°C for salmonid and cyprinid waters. This applies only to breeding periods of species which need cold water for reproduction, and only to those waters which may contain such species. A provision is also made in these Regulations that over-sudden variations in temperature should be avoided.

Both of these factors should be considered where appropriate in substantial change decisions.

A.13.7 Substantial change tests for **coastal and brackish waters** can be derived using the temperature differences as specified in the Council Directive of 30th October 1979 on the Quality Required of Shellfish Waters (79/923/EEC). The Directive specifies that a discharge affecting shellfish waters must not cause the temperature of the waters to exceed by more than 2°C the temperature of waters not so affected.

A.13.8 Applying the principles specified in paragraph A.13.2 for all coastal or brackish controlled waters, an increment of 0.4°C (20% of 2°C) at the point downstream of the thermal discharge should normally be considered a substantial change. If the increment is less than 0.4°C but the resulting temperature difference is greater than 2°C the change should also be regarded as substantial.

A.13.9 Note that additional requirements may arise in connection with sites and species protected under the Conservation of Habitats and Species Regulations 2010, on which more general information is given in section A.15 of this guidance. Guidance under these Regulations makes a change in mean temperature of more than 0.2°C

the trigger for an “appropriate assessment” for sensitive habitats/species. By implication, any such change would also normally be a substantial change for the purposes of EPR (see section A.15), even if it were not otherwise caught by the guidance in the paragraphs above.

A.13.10 Any changes affecting the temperature of **groundwater** are unlikely, but may arise, most commonly by re-injection of cooling water back into the aquifer from which it had been abstracted originally. The temperature of groundwater tends to be fairly consistent at around 11-12°C. A discharge or other activity that causes a change in the temperature of more than 1-2°C downstream of the discharge point (e.g. at 50m downstream) would be considered significant and, as a general rule, should be taken to be a substantial change. In cases where activities are proposed that would lead to the heating of groundwater, the assessment of whether this threshold is exceeded will need to be site-specific, taking advice as appropriate from colleagues with groundwater expertise.

A.14 Noise and vibration

A.14.1 Whether or not any changes in noise and vibration emissions are considered substantial should be assessed on the basis of the degree of any resulting increase in offence to human senses or interference with amenity. The change must be determined at the appropriate noise sensitive receptor. It may be assessed by measurement at the receptor, or at another suitable location and the receptor levels then calculated.

A.14.2 Consideration should be given to any change in noise characteristics, or acoustic features (e.g. whine, hiss, screech, hum, bangs, click, clatters, thumps or irregularity), as well as any increase in the specific noise level. Additional consideration should be given to any increase in the L_{Amax} measured with the fast time weighting exceeding 60dB at the façade of any bedrooms in order to prevent sleep disturbance. (This may also apply during the day to hospitals and similar premises.)

A.14.3 Other factors to consider include new sources, a different on-site location, or a change in working hours or patterns which could require consideration of a sensitive receptor previously unaffected.

A.14.4 Generally speaking there might be a substantial change if:

- i) a different sensitive receptor would be exposed to a noise level which is likely to give reasonable cause for annoyance;
- ii) an existing noise sensitive receptor is likely to experience a 5dB or more increase in the Rating Level; or
- iii) the L_{Amax}, is likely to exceed 60dB at the façade of a room regularly used for sleeping.

- A.14.5 More advice on the standards used and sensitive receptors are described in our technical guidance note H3 *Noise assessment and control*. The definitions used can be found in BS4142: 1997 *Method for rating industrial noise affecting mixed residential and industrial areas*.
- A.14.6 In the case of vibration, changes to activities which make it more noticeable should be considered, including:
- (i) an increase the existing vibration exposure;
 - (ii) a change in the hours, or times, of exposure;
 - (iii) an increase the perceptibility of the exposure; or
 - (iv) a change the frequency or characteristics of vibration which makes it more noticeable (such as irregularity).
- A.14.7 Noise and vibration may also affect other receptors in addition to humans. The most important cases will be those where there are impacts on particularly sensitive or significant receptors, which should be dealt with as described below.

A.15 Effects on sensitive receptors

- A.15.1 Specific attention will be required to address particularly sensitive environmental receptors. A change that is not substantial in one location might be in another, if a sensitive receptor is affected. For example, in assessing a proposed modification, consideration should be given to the impact on SACs, cSACs and SPAs, Ramsars, SSSIs, local sites designated for nature conservation purposes and Nitrate Vulnerable Zones.
- A.15.2 In addition, regard should be had to DETR Circular 02/99 on Environmental Impact Assessment which relates to England and Wales (EIA - discussed more generally in section A.16 ahead). This requires careful consideration of the need for EIA in the case of development within or affecting SSSIs, AONBs, National and Local Nature Reserves, National Parks, World Heritage Sites, scheduled monuments, land to which Nature Conservation Orders apply and international conservation sites (such as SACs and SPAs). Also regard should be had to PPS 9 (Planning Policy Statement 9 – Biodiversity and Geological Conservation. Also for Wales the Technical Advisory Note 5 – Nature Conservation and Planning) and the Biodiversity Circular (Defra 01/05, ODPM 06/05) which details the requirements in relation to development and nature conservation sites generally and the considerations that apply.
- A.15.3 Special regard should be had to the Conservation of Habitats and Species Regulations 2010. These Regulations provide that, before granting a permit or permit variation and where the proposal “is likely to have a significant effect” on a European site (i.e. cSAC, SAC or SPA), then an “appropriate assessment” of the implications for the site, in view of its conservation objectives, must be undertaken. Our guidance

document “Habitats Directive: *taking a new permission, plan or project through the regulations*” (183_01 version 8) considers the meaning of “significant effect” for these purposes. It states that a likely significant effect is any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding trivial or inconsequential effects. This guidance should also be followed when assessing substantial change in terms of effects on other sensitive receptors (see paragraphs A.15.1 and A.15.2 above).

- A.15.4 Broadly, therefore, a change in operation at an installation should be considered substantial if it is likely to give rise to the need to undertake an “appropriate assessment” for the purposes of the Habitats Regulations. However, the construction phase of the plant/project is excluded from consideration.
- A.15.5 Our guidance on applying the Habitats Regulations contains some distance criteria that should be used as an initial indication to determine whether the Habitats Regulations are relevant. These include the following:
- for waste management activities falling within Schedule 1 EP Regulations (Schedule 1 Part 2, section 5.3 & 5.4), 2 km from a European site (5 km for a landfill); and
 - □for other activities falling within Part 2 to Schedule 1 of the EP Regulations, 10 km from a European site (15 km for a power station).
- A.15.6 The general rule is that installations beyond these distances from a European site are unlikely to have a significant effect. It is important, however, that these criteria are not used in isolation and without proper reference to the Habitats Directive guidance. This states, for example, that judgement should be used in applying the criteria, and the distances extended if necessary depending on the nature of the installation, prevailing wind conditions, etc. The Habitats Directive guidance also gives examples of the types of effects on European sites that are likely to be “significant effects”.
- A.15.7 In relation to SSSIs any permit for an operation which is likely to damage SSSI features needs to be considered and consulted upon with Natural England /NRW. Our guidance *CROW guidance (124-02)* details the requirements for permissions that may affect SSSIs
- A.15.8 In relation to Air Quality Management Areas, the criteria in paragraphs A.2.3 and A.2.4 will already address the extent to which a change at an installation impacts upon air quality standards, and no further special consideration is required.
- A.15.9 In relation to local sites designated for nature conservation purposes, any permit for an operation which is likely to lead to concentrations or deposition which is 100% of the appropriate critical level or load needs to be considered.

A.16 Environmental impact assessment (EIA)

A.16.1 EIA requirements are specified principally by the Town and Country Planning (Environmental Impact Assessment) (England & Wales) Regulations 1999. Government guidance on these Regulations is provided in DETR Circular 02/99.

A.16.2 It should be noted that wherever a Local Planning Authority (LPA) has required an Environmental Statement (ES) under these Regulations in respect of a change or extension, it must have determined that the change or extension may have “significant adverse effects on the environment”. Therefore, the definition of substantial change in the Regulations and the statutory criteria stipulated for requiring an ES under the EIA Regulations are, in essence, identical. In consequence, where an ES has been required by an LPA in respect of a proposal, we should consider carefully the LPA’s explanation for concluding that a “significant adverse effect” may be involved. If the LPA’s decision was made *solely* in terms of visual amenity or land use planning criteria which would be beyond the remit of the EP Regulations (i.e. see paragraphs 5.7 and A.9.1), then their conclusion would not be of direct relevance to our consideration of the issue.

A16.3 However, if their conclusion is based on, say, concerns over air quality (or some other issue within the remit of the EP Regulations), then careful consideration should be given to their reasoning and care should be taken if we propose to depart from the conclusion reached.