

**EXPLANATORY MEMORANDUM TO  
THE DETERGENTS REGULATIONS 2010**

**2010 No. 740**

1. This explanatory memorandum has been prepared by the Department for Environment, Food and Rural Affairs and is laid before Parliament by Command of Her Majesty.

This memorandum contains information for the Joint Committee on Statutory Instruments.

2. **Purpose of the instrument**

2.1 To enable the Government to:

- charge (set and collect) fees to recover costs associated with the evaluation of applications to market detergent products (specifically, for derogations); and
- introduce a ban on the sale of domestic laundry cleaning products (DLCPs) containing phosphates.

3. **Matters of special interest to the Joint Committee on Statutory Instruments**

3.1 None.

4. **Legislative Context**

4.1 This instrument is being made because Regulation (EC) No. 648/2004 requires surfactants and detergents containing surfactants to pass a three-tier system of aerobic testing to ensure they meet certain environmental criteria before they can be placed on the market. Products passing the ultimate biodegradability test can remain on the market. Those used in industrial and institutional detergents that fail ultimate biodegradability but pass primary biodegradability will be allowed to remain on the market if the manufacturer is granted derogation by the Commission.

4.2 Applications for derogation must be submitted, in the first instance, to Member States who will conduct an evaluation. Regulation (EC) No. 648/2004 provides for Member States to recover costs associated with the evaluation work. Although this EC Regulation is directly applicable, the UK was required to make secondary legislation which would set out our enforcement mechanisms; this was achieved through the Detergents Regulations 2005 (SI 2005 No.2469). The Detergent Regulations 2005 did not, however, enable HSE's Chemicals Regulation Directorate (CRD), to recover the full economic cost of evaluating (by risk assessment) applications for derogation. Under the Detergents Regulations 2010, CRD will recover the full economic costs of applications for derogation as it will perform the functions of the UK competent authority on behalf of the Secretary of State.

4.3 These Regulations are also being made to introduce a prohibition on the placing on the market of certain laundry detergents, namely DLCPs. This is for the purpose of reducing pollution in water and contributing to the UK's achievement of the objectives of Directive 2000/60/EC establishing a framework for community action in the field of water policy. Article 14 of Regulation (EC) No. 648/2004 on detergents states that, pending further harmonisation, Member States may lay down national rules concerning the use of phosphates in detergents.

4.4 The Detergent Regulations 2005 are therefore being revoked and re-enacted to incorporate these new provisions.

4.5 It should also be noted that Regulation (EC) No. 648/2004 was amended by Regulation (EC) No. 907/2006 and Regulation (EC) No. 1336/2008. These amendments introduced a number of minor technical amendments: introduction of additional test method; inclusion of web addresses on labels; declaration of allergenic fragrances added in the form of pure substances; and greater consistency in listing of ingredients and labelling of industrial and institutional products. These are directly applicable in UK law but reference is made to the amending Regulations in this instrument.

4.6 The minister made a commitment in the document 'Future Water (Defra 2008)' to do more to tackle pollution from phosphates from domestic laundry cleaning products and consult on the possibilities for phasing out phosphates as an ingredient in domestic laundry cleaning products. The majority of responses received during consultation on this issue were in favour of a limitation on phosphates in domestic laundry cleaning products.

## **5. Territorial Extent and Application**

5.1 This instrument extends and applies to all of the United Kingdom.

## **6. European Convention on Human Rights**

6.1 As the instrument is subject to negative resolution procedure and does not amend primary legislation, no statement is required.

## **7. Policy background**

- *What is being done and why*

7.1 As stated above, although Regulation EC No. 648/2004 is directly applicable, the UK was required to introduce a Statutory Instrument setting out enforcement mechanisms. This was done in the Detergents Regulations 2005 (SI 2005 No.2469). These Regulations did not, however, enable CRD to recover the full economic cost of evaluating (by risk assessment) applications for derogation.

7.2 That said, no derogation applications have to date been received by CRD. It is, however, possible that derogation may be sought as new products are developed, but feedback from the main industry association (the UK Cleaning Products Industry Association (UKCPI)) suggests this is unlikely. This is because there is a large range of environmentally safe surfactants which can be used and manufacturers can readily reformulate, in order to avoid using a surfactant that might require derogation. However, as the trade association does not represent all of the industry we have assumed, for illustrative purposes for the Impact Assessment, that over the next 10 years we will receive an average of a single complex application from a medium sized company each year.

- *Consolidation*

7.3 Not applicable.

## **8. Consultation outcome**

8.1 The Government has conducted three separate consultations on the provisions which necessitate the remaking of the Detergent Regulations 2005. On fees, a consultation in 2006 elicited industry views on the fairest type of fee to be levied; there was universal support for a sliding scale, rather than a flat fee. This is because some applications for derogation will be more complex than others and applying a flat fee would not be fair on those applications requiring minimal evaluation work. Paper and email consultations were sent out to a wide variety of

organisations, including industry associations and individual firms, representatives of the Small to Medium Enterprise (SME) sector, environmental groups and governmental organisations, including local authorities and the devolved administrations. The consultation was also published on the Pesticides Safety Directorate (PSD) (now CRD) and Defra websites. Shortly before the consultation was due to close, a reminder was posted on the PSD homepage. PSD received eight responses to the consultation.

8.2 Defra carried out consultations on the proposals to ban the sale of DLCs containing phosphate in February 2008 and in October 2009. The 2008 consultation introduced the prospect of a ban on phosphates in DLCs and was generally supported. The 2009 consultation proposed use of the Detergent Regulations as a method for delivering the ban, and also covered the proposed introduction of updated fees following the 2006 consultation. The deadline for response to this consultation was 21st January 2010.

## **9. Guidance**

9.1 On fees for applications for derogation, CRD will issue a routine Regulatory Update on its website and will copy it to industry trade association contacts, as well as to consultation respondents. Given the need to change the existing SI in order to introduce a fees and charges schedule, a voluntary or self-regulatory approach are both inappropriate mechanisms in this case. Given too that the action to revoke and remake the current Detergent Regulations 2005 is primarily to introduce a fees regime that industry has agreed to in principle, the likelihood of any political or legal backwash occurring as a result of this change is assessed as low, as is the level of public interest beyond the limited number of stakeholder responses received.

9.2 Defra will publish guidance on the detail of how the ban (on the marketing of DLCs containing phosphate) will work. This guidance will be produced following the analysis of responses to the consultation on these draft Regulations. It will detail what the ban means and how it should be applied. It will be targeted at the retail industry as well as the UK cleaning products industry.

9.3 As industry was broadly in favour of a ban on phosphates in DLCs, then this element of the legislation should not attract any unfavourable feedback.

## **10. Impact**

On fees:

10.1 Experience suggests that there will be no impact on business. There is no impact on charities or voluntary bodies.

10.2 There is no impact on the public sector.

10.3 An Impact Assessment is attached to this memorandum at annex 1.

On ban on phosphates in DLCs:

10.4 The impact on business is detailed in the Impact Assessment attached. There will be some impact on detergent manufacturers which they are aware of. The UKCPI provided Defra with estimates of the impact on manufacturers this included transition costs of £10-15 million capital and £5-8 million per year. No impact is expected on charities or voluntary bodies.

10.5 The impact on the public sector is, potentially, a small increase in the cost of around 10% of DLCs.

10.6 An Impact Assessment is attached to this memorandum at annex 2.

## **11. Regulating small business**

On fees:

11.1 The legislation applies to small business.

11.2 To minimise the impact of the requirements on firms employing up to 20 people, the approach taken is that all surfactant manufacturers in the sector will be faced with the costs of ultimate biodegradability testing (£3,000 - £5,000) per surfactant (unless their surfactants have already been tested). A common approach within the sector may help to develop economies of scale in testing and optimum utilisation of outstanding testing capacity. Such an approach may help smaller producers.

On ban on phosphates in DLCs:

11.3 The legislation applies to small business. However the detergent industry and BIS had no concerns for small businesses since we found no evidence of any small businesses involved in manufacture of detergents containing phosphates. Also there were no responses from small business to Defra consultations on the issue of a ban in phosphates. The sale of detergent containing phosphate will be banned but we do not expect this to have any impact on retail businesses since it is not a key product which any retail business would rely on.

## **12. Monitoring & review**

On fees:

12.1 The changes in the fee structure aim to achieve full cost recovery of the process of evaluating applications for derogation.

12.2 CRD will review and forecast aggregate and per-case income and expenditure against actual expenditure on an annual basis. The fee structure relies on estimates, which CRD will refine over time.

On ban on phosphates in DLCs:

12.3 Monitoring to ensure that the ban is effective will take two forms – Local Authorities Trading Standards Officers will check on sales of detergent where there is reason to believe that detergent containing phosphates are on sale. Government will also discuss progress with the detergents industry to ensure that the industry is on track with phase out of the manufacture of detergents containing significant quantities of phosphate compounds.

## **13. Contact**

Tracey Ware at the Chemicals Regulation Directorate Tel: 01904 455754 or email: [tracey.ware@hse.gsi.gov.uk](mailto:tracey.ware@hse.gsi.gov.uk) can answer any queries regarding derogation fees.

Andrzej Nowosielski of Water Quality Division of Defra can answer queries on the phosphate ban.

Telephone 02072385864  
[andrzej.nowosielski@defra.gsi.gov.uk](mailto:andrzej.nowosielski@defra.gsi.gov.uk)

## **Annex 1**

### **Impact assessment for new fee structure**

1. Summary: Intervention & Options		
<b>Department /Agency:</b> Defra, Pesticides Safety Directorate, Defra	<b>Title:</b> Remaking detergents regulations (charging provisions)	
<b>Stage:</b> Implementation stage	<b>Version:</b> 2.3	<b>Date:</b> 12 March 2008
<b>Related Publications:</b> EC Regulation 648/2004 on Detergents		

**Available to view or download at:**

<http://www.pesticides.gov.uk>

**Contact for enquiries:** Kerry Hutchinson

**Telephone:** 01904 455 967

**What is the problem under consideration? Why is government intervention necessary?**

Detergent Regulation (EC) No. 648/2004 provides that only detergents and surfactants for detergents complying with certain conditions may be marketed. It also provides that the Commission may grant derogations to market products used for industrial or institutional use which do not comply with these conditions. Derogation requests must be submitted to Member States for evaluation. The Regulation provides authority to charge fees to recover the costs associated with this work.

The Statutory Instrument developed to transpose the Regulation into UK law has no similar cost recovery provisions. This amendment would create the necessary powers.

**What are the policy objectives and the intended effects?**

To ensure those deriving economic benefits from the ability to market products granted by way of the derogation bear the costs associated with considering applications rather than taxpayers.

The amendment also clarifies that Regulation (EC) No. 648/2004 has been amended by Regulation (EC) 907/2006. This amending Regulation introduces a small number of technical amendments to the methods by which those marketing these products demonstrate compliance with the relevant conditions and labelling requirements. These are minor technical amendments and not discussed in depth in this document.

**What policy options have been considered? Please justify any preferred option.**

Do not re-make the current regulations. This was discounted on the grounds that it would mean that taxpayers would fund activity more properly paid for by industry.

Amend the SI to create a general power to collect fees. As evaluation work is based on a tiered approach (involving more work on some applications than others) we propose to create a sliding scale (as opposed to flat rate) fee structure. This is the preferred option from the others that were discussed and discarded in the previous RIA.

**When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?** 2009, immediately after the European Commission reviews its Detergent Regulation 648/2004 that same year.

**Ministerial Sign-off** For final proposal/implementation stage Impact Assessments:

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister:

Huw Irranca-Davies

..... Date: 8th March 2010

## 2. Summary: Analysis & Evidence

<b>Policy Option:</b>	<b>Description:</b>
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<b>COSTS</b>	<b>ANNUAL COSTS</b>		Description and scale of <b>key monetised costs</b> by ‘main affected groups’ We would charge applicants a basic co-ordination fee of £1400 for all applications, and additional charges of: £2000 for a Tier 1 assessment, £3000 for a Tier 2 and £4000 for a Tier 3 assessment.  To illustrate the costs we have theoretically assumed we will receive an average of one complicated application from a medium sized company every year. This amendment transfers costs from Government to Industry. Present Value Cost to Industry: £50,000 Present Value Cost to Government: £-50,000
	<b>One-off (Transition)</b>	<b>Yrs</b>	
	£ 0	10	
	<b>Average Annual Cost (excluding one-off)</b>	<b>Cost</b>	
	£ 5400		
<b>Total Cost (PV)</b>			£0
Other <b>key non-monetised costs</b> by ‘main affected groups’ None identified			

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>		Description and scale of <b>key monetised benefits</b> by ‘main affected groups’
	<b>One-off</b>	<b>Yrs</b>	
	£ n/a	10	
	<b>Average Annual Benefit (excluding one-off)</b>	<b>Benefit</b>	
	£ n/a		
<b>Total Benefit (PV)</b>			£ n/a
Other <b>key non-monetised benefits</b> by ‘main affected groups’ Taxpayers will not be required to cover costs associated with evaluation of derogation requests. The sole justification for making the changes to the current SI is merely to provide the vires to charge, should a manufacturer ever apply for a derogation, which based on evidence from industry, is so unlikely as to be discountable.			

### Key Assumptions/Sensitivities/Risks

Assumes ‘average’ of one tier 3 assessment request each year from a medium sized company. Manufacturers are under no obligation to apply, as they actually reformulate using alternative surfactants that already comply with the necessary conditions. So in reality, costs to industry of amending/remaking the current SI would be zero.

Price Base Year 2008	Time Period Years 10	<b>Net Benefit Range (NPV)</b> £ N/A	<b>NET BENEFIT (NPV Best estimate)</b> £ 0
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What is the geographic coverage of the policy/option?	UK
On what date will the policy be implemented?	April 2008
Which organisation(s) will enforce the policy?	Local Authority TSOs
What is the total annual cost of enforcement for these organisations?	N/A
Does enforcement comply with Hampton principles?	N/A



Will implementation go beyond minimum EU requirements?				No	
What is the value of the proposed offsetting measure per year?				N/A	
What is the value of changes in greenhouse gas emissions?				N/A	
Will the proposal have a significant impact on competition?				No	
Annual cost (£-£) per organisation (excluding one-off)	Micro n/a	Small n/a	Medium 4000	Large n/a	
Are any of these organisations exempt?	No	No	No	No	

<b>Impact on Admin Burdens Baseline (2005 Prices)</b>			<b>(Increase - Decrease)</b>	
Increase of £ 0	Decrease of £ nil	<b>Net Impact</b>	£ 0	

Key: Annual costs and benefits: (Net) Present Value

#### Problem and Intervention

1. Regulation (EC) No. 648/2004 requires surfactants and detergents containing surfactants, to pass a three-tier system of aerobic testing to ensure they meet certain environmental criteria before they can be placed on the market.
2. Products passing the ultimate biodegradability test can remain on the market. Those used in industrial and institutional detergents that fail ultimate biodegradability but pass primary biodegradability will be allowed to remain on the market if the manufacturer is granted a derogation by the Commission. Applications for derogations must be submitted, in the first instance, to Member States who will conduct an evaluation. The Regulation provides for Member States to recover costs associated with the evaluation work. The Regulation required manufacturers to apply for derogations for products already on the market by October 2007.
3. Although the Regulation is directly applicable the UK was required to introduce a Statutory Instrument setting out enforcement mechanisms. This is done in the Detergents Regulations (SI 2005 No.2469). These Regulations did not, however, enable PSD to recover the full economic cost of evaluating (by risk assessment) applications for derogations.
4. No derogation applications were received. It is, however, possible that derogations may be sought as new products are developed, but feedback from the main industry association (the UK Cleaning Products Industry Association) suggests this is unlikely. This is because there is a large range of environmentally safe surfactants which can be used and manufacturers can readily reformulate, in order to avoid using a surfactant that might require a derogation. However, as the trade association does not represent all of the industry we have assumed for the purposes of this Impact Assessment that over the next 10 years we will receive an average of a single complex application from a medium sized company each year.
5. Legal advice is that the most appropriate way to recover such costs is by creating a general power within the Statutory Instrument enabling the collection of an appropriate fee. Advice on fees, which would be reviewed on an annual basis, would be published in relevant guidance documents and on the PSD website. This avoids the need to constantly remake legislation setting out fees and is an approach which meets the Better Regulation and Red Tape agendas.
6. We propose to charge a sliding scale of fees to mirror the tiered approach of risk assessment set out by the European Commission in its Technical Guidance Document on procedures for assessing requests for derogations. All applications would be subject to a £1,000 co-ordination fee. This would include evaluating the initial application, liaising between the manufacturer and the Commission as necessary, seeking input from PSD specialists and producing the final evaluation.
7. In addition to the basic co-ordination fee applicable to all applications, we propose to charge an additional £2,400 to evaluate applications up to and including a tier 1 risk assessment, £3,400 for applications containing a tier 2 risk assessment, and £4,400 for those containing a tier 3 risk assessment. This is to reflect the fact that an increasing amount of specialist input will be required as the applications become more complex. Details of how these costs are calculated can be found in the Annexes.
8. We believe it unlikely that any derogations will be sought. However, to illustrate the costs over 10 years we have assumed we will receive an average of one complicated application from a medium sized company every year as this is likely to overestimate any costs.

Co-ordination fee: £1,000

Tier 2 risk assessment: £4,400

Total cost to industry per year: £5,400

Total present value cost to industry over 10 years: £50,000

9. As this legislation seeks to transfer the full economic cost of a derogation application to from government to industry, the scheme will have a cost saving to government equal to £50,000 in our illustrative example. **Therefore the overall costs will be £0.**
10. We have estimated no increase admin burden as a result of this change in regulations. This is because in reality we do not expect to receive any applications for derogation. The assumption of one application per year was merely used for illustrative purposes and would not be appropriate for the calculation of admin burden.
11. It should also be noted that Regulation (EC) No. 648/2004 was amended by Regulation (EC) No. 907/2006. This amendment introduced a number of minor technical amendments: introduction of additional test method; inclusion of web addresses on labels; declaration of allergenic fragrances added in the form of pure substances; and greater consistency in listing of ingredients and labelling of industrial and institutional products. These are directly applicable in UK law but reference will be made to the amending Regulation in the remade Statutory Instrument.

### **Policy Objectives and Intended Effects**

12. The policy objective is to ensure UK taxpayers do not bear the costs associated with considering applications for derogations. Such costs should be borne by the manufacturer who will derive economic benefit from this work. However, it must be stressed that the likelihood of a manufacturer so doing are virtually zero. See para 11 below for more detail.
13. No derogation applications have yet been received. This is because manufacturers have a large range of surfactants to choose from, and according to the UKCPI, manufacturers invariably substitute a surfactant that has not passed all biodegradability tests, with one that has, thus avoiding the need to apply for a derogation.
14. In general, the research and development of detergent products is static, with manufacturers marketing tried and tested products with years of household brand loyalty. The likelihood of a new product entering the market is therefore low, and the similar likelihood of a company developing a new product that will include a surfactant in the formulation that requires a derogation, is expected to be lower still. However, the possibility of a manufacturer applying for a derogation in future, cannot be completely ruled out, and the costings are therefore based on a hypothetical case of PSD receiving one application requiring full-tier testing a year.

### **Policy Options**

15. PSD considered the following policy options in the previous RIA:

- **Do not remake the current regulation.**

If no change were made to the existing Regulation, PSD would have no vires to charge the applicant, and taxpayers would have to bear the costs associated with consideration of an application for a derogation.

- **Remake the existing Regulation enabling PSD to charge a flat fee for considering applications for derogations.**

A tiered approach must be taken to the risk assessment, meaning that derogation applications will vary in complexity and will require more detailed evaluation if they include a tier 2 or 3 risk assessment. It would therefore be unfair to charge a flat fee for everyone, as less complex applications may not need as much specialist evaluation time. We did not therefore favour charging a flat fee

Furthermore, it was not appropriate to include a flat fee within the Regulations. This is because fees will be reviewed (and perhaps reset) on an annual basis to ensure costs are recovered. This would necessitate regular re-making of the statutory instrument. Legal advice is that creating a general power to set fees in the Regulations and then specifying fees in the relevant guidance documents/website would be a legally enforceable and the most efficient mechanism.

- **Remake the existing Regulation to enable PSD to charge against a system of sliding scale of fees to mirror the tiered approach as set out in the EC's Technical Guidance Document.**

We believe it is more appropriate to charge against a system of sliding scale of fees, for the reasons explained above.

Responses to the consultation conducted between November 2005 and February 2006 indicated that such an approach was fair, and the sliding scale of fees would enable a firm to better assess whether they wished to apply for a derogation.

**This is the recommended option.**

#### 4. Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

**Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.**

Type of testing undertaken	<i>Results in Evidence Base?</i>	<i>Results annexed?</i>
Competition Assessment	Yes	Yes
Small Firms Impact Test	Yes	Yes
Legal Aid	No	Yes
Sustainable Development	No	Yes
Carbon Assessment	No	Yes
Other Environment	Yes	Yes
Health Impact Assessment	No	Yes
Race Equality	No	Yes
Disability Equality	No	Yes
Gender Equality	No	Yes
Human Rights	No	Yes
Rural Proofing	No	Yes

### Problem being addressed and benefits of legislation

1. Regulation (EC) No. 648/2004 is designed to improve the environment and public health, as detergents containing surfactants not meeting the biodegradability standards set out in the Regulation will not be sold in the European Community.
2. More specifically the benefits are:
  - Extending the scope of detergents legislation to cover a greater percentage of surfactants under biodegradability testing requirements. (Surfactants that are used solely as ingredients in biocidal products will be classified under the Regulation as ‘disinfectants’, and as such will not be subject to its biodegradability testing requirements.) This could lead to a reduction in the risk of foaming incidents in UK rivers. Foam is not routinely measured in the UK. However, an aesthetic quality survey by the Environment Agency in 2000 showed that foam was present at 28.5 per cent of the 452 sites covered. Of the total amount of sites where foaming was identified, 1.1 per cent were classified as bad. Foam can also be an issue at the site of some sewage treatment works, and surfactants are also linked with some reported water pollution incidents, although these were less than 0.7 per cent of total incidents in 2001. It should also be noted that foaming in rivers can be a natural occurrence unrelated to the presence of surfactants in watercourses;
  - Elimination of persistent metabolites from the aquatic environment arising from surfactants, with a resulting reduction in the risk of toxic and cumulative effects;
  - Improvements might arise in the efficiency of those sewage treatment works that process significant quantities of such surfactants. Improvements might also accrue to individual companies that treat their own effluent prior to direct discharge to watercourses. Surfactants reduce the oxygen transfer efficiency of sewage treatment works, so an increase in biodegradability might result in a reduction in running costs. However, no evidence is available to quantify this potential benefit, although opinion is that it is likely to be marginal;
  - Improved access for health care professionals to data on substances that they consider could cause irritant or allergic reactions. This could reduce the number of cases of allergic reaction and improve the treatment of any such cases;
  - Removal of any trade barriers relating to different product and labelling requirements between Member States, with associated improvements in competition and consumer choice. Although this is one of the stated aims of Regulation 648/2004, it should be noted that earlier consultations on the proposals has suggested that UK firms do not perceive there to be significant barriers in European surfactant markets which would be addressed; and
  - Improved information on product ingredients for consumers, enabling them to make more informed choices as to their preferred products.

### Implementing legislation

3. Although EC Regulations are directly applicable it was necessary to introduce a Statutory Instrument (the Detergents Regulations 2005 (SI 2005 No.2469) to enable enforcement of the relevant provisions. The implementing Regulations also made clear that detergents or surfactants being marketed should comply with the conditions stipulated in the EC Regulation.

4. Given the relatively short implementation period, the implementing legislation was a basic set of enforcement regulations. It was always our intention to consult on the derogation provisions (which would not enter into force until much later) at a future date. This consultation was duly carried out. Eight responses were received and were generally supportive of a sliding scale fee structure for derogation applications.
5. The re-made Regulations will apply throughout the UK and will:
  - explain the procedure for handling of derogation applications in the UK including setting out powers to charge appropriate fees.
  - revoke and remake the Detergents Regulations 2005 so that all domestic provisions to implement EC Regulation 648/2004 (and any amendments) will be contained in one set of UK regulations.

## **Procedures**

6. Regulation (EC) No. 648/2004 includes a two-tier system of aerobic testing. Surfactants passing an ultimate biodegradability test can remain on the market. Those surfactants used in industrial and institutional detergents that fail ultimate biodegradability but pass primary biodegradability will be allowed to remain on the market if the manufacturer is granted a derogation by the Commission. Manufacturers will be required to keep test data for inspection by national authorities.
7. Manufacturers had to apply for derogations within two years of the entry into force of Regulation 648/2004 if they wished to keep their surfactant on the market while their application was being considered. Derogations require a complementary risk assessment to be undertaken, and will be refused when use of a product occurs in high volumes, in wide-dispersive applications as opposed to low dispersive applications (e.g. by the general public, as opposed to specialist, niche uses), and where the risk to the environment or to health posed by the volume of sales and the pattern of use throughout the EU is large compared to the socio-economic benefits, including food safety and hygiene standards.
8. The Pesticides Safety Directorate (PSD) is the competent authority in the UK for the purposes of Regulation 648/2004. This means that PSD is responsible for the first stage of the derogations procedure, i.e. for evaluating the initial application.

## **Purpose of remade legislation**

9. Remaking the Regulations to set out the procedure for derogation applications will mean that the UK is able to fulfil its responsibilities under Regulation 648/2004, which states that a Member State's Competent Authority is responsible for evaluating the derogation application.
10. The inclusion of provisions enabling PSD to collect a fee for evaluating applications will ensure full cost recovery (if/when we carry out this work), with the burden transferring to industry under the polluter pays and risk owners pay for risk mitigation principles. As a full cost agency such a charge is not seen as a tax or levy on the trade but recovering the costs in providing this service to industry. There are no implications for public expenditure/income.

Annex B: Fees

## **Legislative background**

1. Regulation (EC) No. 648/2004 gives Member States the power to charge a one-off fee for processing and evaluating an application for derogation. Fees must not be levied in a discriminatory way and must not exceed the cost of processing the application.
2. Article 5 of the Regulation sets out what manufacturers need to include in support of their derogation application. The application must include test results from both ultimate and primary biodegradability testing, and a risk assessment on the environmental dangers of any persistent metabolites, in accordance with Annex IV of Regulation 648/2004. More information on the tiered approach that should be adopted when producing this risk assessment can be found in the European Commission's Technical Guidance Document. More details on precisely what a derogation application must contain can be found in Articles 5 and 6, as well as annexes II, III and IV of Regulation (EC) No. 648/2004.
3. A consultation proposed charging a sliding scale of fees, depending on the complexity of the application. This was supported by industry.

### **Fee Calculation and Structure**

4. PSD proposes to charge a fee of between £3400 and £5400 for the handling of derogation applications. The fees vary because of the amount of specialist input required to evaluate different types of application:
5. Those applications up to and including a tier 1 risk assessment outlined in the European Commission's Technical Guidance Document will cost £3400. Those containing a tier two risk assessment will cost £4400. Those containing a tier 3 risk assessment will cost £5400.
6. Of this fee, £1000 would be a co-ordinating fee. This would include liaising with the manufacturer and Commission, and producing the evaluation report, and acquiring input. PSD estimates that this will comprise 18 hours of Higher Scientific Officer time (approx £55 per hour).
7. The rest of the fee would be made up of specialist evaluations (modules), each costing £750. A minimum of two specialist modules will be required to evaluate any application, this results in:
  - 27 hours of HSO time at a cost of £1500 for tier 1 evaluations;
  - 41 hours of HSO time at a cost of £2250 for tier 2 evaluations;
  - 54.5 hours of HSO time at a cost of £3000 for tier 3 evaluations.
8. These fees are based on the system for evaluating applications for pesticide approval. However, in this instance, the fee for co-ordinating the evaluation has been reduced compared to that in place for pesticides because fewer specialist teams will be involved.

### **Forecasts of income & expenditure**

9. It is difficult to be precise or accurate about potential income. The original RIA carried out in support of the Regulation to be amended, suggested that there might have been as many as 54 applications for derogation in total. However, during the two year period of grace from October 2005 to October 2007, the total number of applications for derogations submitted across the entire EU, was just 7. For the reasons, therefore, set out at paragraphs 11 and 12 of the Evidence Base, we anticipate few, if any, applications
10. from UK manufacturers.



**Competition assessment**

1. The extremely small number of applications anticipated means that we do not anticipate any significant effect on competition.

**Legal Aid**

2. The Proposal does not create new criminal sanctions or civil penalties.

**Sustainable Development**

3. PSD does not consider that implementing these Regulations will have any impact on sustainability issues.

**Carbon Impact Assessment**

4. The Proposal will have no significant effect on carbon emissions, because it relates solely to costs of work to process applications for derogations from surfactant testing for individual detergent products. The approval or rejection of such applications would not affect the way detergents are manufactured – a company would merely reformulate using another surfactant from the approximately 5,000 available.

**Other Environmental Issues**

5. As the nature and scale detergent production and marketing is likely to remain the same, the Proposal has no implications in relation to climate change, waste management, landscapes, water and floods, habitat and wildlife or noise pollution.

**Health Impact Assessment**

6. The Proposal will not directly impact on health or well being and will not result in health inequalities.

**Racial equality**

7. PSD does not consider that implementing these Regulations will have any impact on racial equality issues.

**Disability/Gender**

8. There are no limitations on meeting the requirements of the Proposal on the grounds of disability or gender. The Proposal does not impose any restriction or involve any requirement which a person of a particular racial background, disability or gender would find difficult to comply with. Conditions apply equally to all individuals and businesses involved in the activities covered by the Proposal.

**Human Rights**

9. The Proposal is consistent with the Human Rights Act 1998.

**Rural Proofing**

10. The proposal will have no bearing on rural proofing.

## Annex D: Enforcement and Sanctions

1. PSD is the competent authority for the purposes of the Regulation. This means that PSD is responsible for evaluating derogation applications, and sending recommendations to the Commission. Regulation 648/2004 will continue to be enforced on the ground by Local Authority Trading Standards Officers (TSOs) through the Detergents Regulations 2008. There would be no additional costs to local authorities because any enforcement action would be subsumed into their current costs.
2. Under the Detergents Regulations 2005 Local Authority TSOs can already issue enforcement notices if there is a breach of the Regulations. These notices set out the action that a manufacturer needs to take to rectify the problem and state by which date such action should be taken. However, due to the environmental and public health problems that could arise through a breach of the Regulations, the Detergents Regulations 2005 provided that courts could impose criminal penalties for persistent or serious offences.
3. Sanctions along the lines of the “polluter pays” principle would not be appropriate, as it would not be possible to trace pollution incidents back to one individual manufacturer. The penalties remain unchanged under the Detergents Regulations 2008, meaning that the most serious offences against these Regulations will be triable either way and punishable by up to 2 years imprisonment and/or an unlimited fine. We expect any impact on the prison population to be minimal, as we are not aware of any significant levels of non-compliance. The Home Office was content with the offences and penalties contained in the Detergents Regulations 2005.

## Annex E: Monitoring and review

1. The Regulation establishes a Committee procedure to review matters in the Regulation. By 2009 the Commission will produce a report on the effectiveness of Regulation 648/2004. It may also produce proposals to regulate the anaerobic biodegradability of surfactants and the biodegradability of the main non-surfactant ingredients in organic detergents.
2. PSD will review and forecast aggregate and per-case income and expenditure against actual, on an annual basis and update our fee structure to continue to reflect our best understanding of full cost recovery. The initial fee structure relies on estimates, which we will refine over time.

## Annex F: Consultation

### Consultation

The views of the detergents industry on the original Commission proposal were canvassed by DTI in summer 2001, and the Commission’s Enterprise Directorate General conducted a public consultation in autumn of the same year. Defra carried out a public consultation on the proposals during the period March-May 2003. PSD carried out a consultation on the procedures to be put in place for handling derogations between November 2005 and February 2006. The consultation also invited general comments on the Detergents Regulations 2005. As well as formal consultation, Government officials have met regularly with industry representatives and given presentations at industry conferences.

## Annex G: Implementation and delivery plan

## Implementation and delivery plan

1. The Regulation was published in April 2004. As it did not come into force until 8 October 2005, industry and the UK Government had an 18-month implementation period. This gave industry time to start preparing for the changes demanded by Regulation 648/2004, including changes to labelling.
2. Following the publication of the Regulation, Defra continued discussions with stakeholders, including detergent manufacturers, local authorities (who will be enforcing the legislation on the ground) and the Home Office (over the level of penalties that should be available to the courts). Defra also worked with the industry and the SBS so that information on the Regulation and the Detergents Regulations 2005 was disseminated as widely as possible, so that it reached SMEs who may not have been fully aware of either the Regulation's implications or previous public consultation. Since the coming into force of the Detergents Regulations 2005, PSD has continued to offer advice to industry and Local Authority Trading Standards Officers. A public consultation was conducted in autumn 2005, and these Regulations take into account the responses received.

### Annex H: Key dates

8 October 2005	Regulation 648/2004 and Detergents Regulations 2005 came into force.
Autumn/winter 2005	Public consultation carried out on the Regulations setting out the application process for derogations.
December 2005	The Commission releases its Technical Guidance Document on derogations.
8 October 2007	Deadline for submitting derogation applications if manufacturers wanted to keep their surfactant on the market while the application was being considered.
<b>X XXXX /2008</b>	Detergents Regulations 2008 come into force.
8 April 2009	The Commission will have produced a review of Regulation 648/2004.
Ongoing	Officials continue dialogue with industry and local authority trading standards officers.

### Annex I: Other costs/specific impact tests associated with this regime

#### Compliance costs

1. Compliance costs were included in the RIA that accompanied the Detergents Regulations 2005, including the costs associated with making a derogation application. The only additional costs imposed by the Detergents Regulations 2008 are the fees charged by PSD for evaluating those applications. However, the compliance costs from the previous RIA associated with derogation applications, such as testing for ultimate and primary biodegradability and carrying out a risk assessment, are included here for convenience.
2. These costs do not represent a new or additional burden since the laying of the Detergents Regulations 2005 or the coming into force of Regulation (EC) No. 648/2004.

#### Business sectors affected

3. The Regulations apply to all manufacturers and suppliers of surfactants and detergents. However, they are likely to have a greater impact on niche product suppliers in the industrial

and institutional product sector. In particular, those supplying products involved in machine washing, bottle washing, dish washing, metal cleaning, floor cleaning, transportation cleaning, façade cleaning which fall outside the existing biodegradability testing requirements.

#### **Costs relating to the initial (ultimate) biodegradability test**

4. Costs will fall to all surfactant manufacturers for implementing the testing requirement for surfactants. The intention of the Regulation is that most surfactants would only need to be subject to a single test – the ultimate biodegradability test. The cost of this is expected to be in the region of £3,000 to £5,000 per surfactant, a range confirmed by responses to the public consultation on the previous partial RIA.
5. Given that there are an estimated 5,000 surfactants currently used in commerce, the total cost of this exercise could theoretically be as much as between **£15m** and **£25m**. The true theoretical cost could be lower than this, since surfactants used only as disinfectants in biocides are excluded from the Regulation and hence are not subject to its testing requirements. We do not have an estimate of what proportion of the estimated 5,000 surfactants come under this definition.
6. Even before the Regulation came into force, consultation with surfactant manufacturers indicated that many surfactants had already been tested for ultimate biodegradability, and comply with the 60 per cent mineralisation standard. In 2003 only one manufacturer reported not testing for ultimate biodegradability, the remainder reporting at least 50 per cent testing. The reasons for this appear to be consumer demand for more environmentally friendly products, and a lack of reliability of the alternative tests for primary biodegradability, the previous required standard.
7. Even where products have not already been tested for ultimate biodegradability, the Regulation will not necessarily result in a large increase in testing, since consultation suggests that some products will simply not be subject to the new tests, especially if they are expected to fail. The result of these considerations may be that the number of surfactants being tested for ultimate biodegradability is substantially less than 5,000, with resulting implications for costs. If 50 per cent of currently regulated surfactants, and zero per cent of non-regulated surfactants, have already been tested for ultimate biodegradability, and 10 per cent of the currently unregulated surfactants would not be tested due to expected failure (based on an estimate of 20 per cent total potential failure (derived from a small number of consultation responses)), then the number being tested would be:

50% of 4,500+90% of 500 =2,700, with the costs of ultimate testing falling between **£8.1m** and **£13.5m**.

$(2,700 \times £3,000 = £8.1m$

$2,700 \times £5,000 = £13.5m$

**50% of 4,500 plus 90% of 500 = 2,700 with the costs of ultimate testing falling between £8.1m and £13.5m**

**$3,000 \times 2,700 = £8.1m$**

**$5,000 \times 2,700 = £13.5m$**

8. This figure could be further reduced if manufacturers cooperate in testing common substances, for instance, through industry associations. Consultation suggests this could occur, although conflicting views have been expressed as to how likely it is. In addition previous data sharing in this area is reported to have been limited. It has also been suggested

that competition and confidentiality concerns could mean that a data-sharing approach will take longer than one in which all manufacturers are responsible for testing their own products.

9. SMEs not previously subjected to these testing requirements, particularly those in the industrial and institutional sectors producing cationic and amphoteric surfactants, will be most significantly affected by these requirements and more likely to fail to meet initial tests.
10. It is anticipated that 3-10% of surfactants will fail the ultimate biodegradability testing requirements. This is largely due to the uncertainty associated with cationic and amphoteric surfactants.

#### **Costs arising from a failure of the initial test (Primary Biodegradability Test and Complimentary Risk Assessment)**

11. Only products failing the ultimate biodegradability test will have to pass a primary biodegradability test prior to being placed on the market. The cost of this test will depend on whether a screening test or more extensive tests were required. The cost of a screening test is in the region of £2,000 per surfactant, whilst a confirmatory test is in the region of £8,000 to £10,000 per surfactant. However, there could be additional costs of up to £40,000 per surfactant if analytical methods needed to be developed.
12. Products failing the ultimate biodegradability test but passing the primary test will also require a complementary risk assessment. This risk assessment will determine if derogation is granted and whether the product can remain on the market. This risk assessment will involve the supply of a technical file, containing information on ultimate and primary biodegradability test results, as well as on use of the surfactant, available alternatives, and impacts on the environment. PSD or the EC may request additional information if this is required to assess the case for derogation. Industry is unsure of the potential costs that may be associated with this process. Costs are likely to depend on the results of testing, and the complexity of use patterns and pathways to the aquatic environment.
13. An estimate for the total costs associated with these proceedings could, according to the consultation results, be between £50,000 and £250,000. The number of surfactants potentially subject to primary testing is limited to those not covered by existing legislation, i.e. cationic and amphoteric surfactants, since the remainder (around 90 per cent) are already required to meet primary biodegradability standards. However, all surfactants failing ultimate biodegradability are likely to require risk assessments to be carried out if they are to be marketed, as this is not a requirement under existing legislation.
14. Consultation suggests that many surfactants that fail the ultimate biodegradability test will cease to be marketed, rather than be subject to primary testing, since risk assessments are expected to be too costly and time consuming to be profitable for most products.
15. Previously we assumed that half of the anionic and non-ionic surfactants (2,250), and 90% of cationic and amphoteric surfactants (450), would be subject to ultimate testing. If we assume that 10 per cent of these fail those tests, this means that there would be 45 candidate surfactants for primary testing, and 270 candidates for risk assessment. As mentioned above, the 2,250 anionic and non-ionic surfactants would not be tested for primary biodegradability because they are already required to meet this standard. If we further assume that 20 per cent of the 45 cationic and amphoteric surfactants would be subject to primary testing, and that 20 per cent of the total would be subject to risk assessment, this gives costs of primary biodegradability of:

**Cost of Primary Testing**

20% of 45 x £5,000 = **£45,000**

at an estimated average of £5,000 per test

**Costs of risk assessment**

20% of 270 x £50,000 = **£2.7m**

at an estimated average of £50,000 per assessment

This gives total costs of the primary testing and risk assessment regime of £2.745m

(£2.7m + £45,000 = **£2.745m**)

20% of 45x£5,000 =£45,000 (at an estimated average of £5,000 per test), and costs of risk assessment of

20% of 270x£50,000 =£2.7m

(at an estimated average of £50,000 per assessment). This gives total costs of the primary testing and risk assessment regime of £2.745m

(£2.7m+£45,000 =**£2.745m**).

**Costs of alternative product development**

16. The EC has estimated that around three to five per cent of existing surfactants (i.e. up to 250) would fail the new test procedure for both primary and ultimate biodegradability and therefore be subjected to product bans. Given that all anionic and non-ionic surfactants are already required to meet primary biodegradability standards, this implies that only cationic and amphoteric surfactants are expected to be among those failing both tests. A figure of 250 failing surfactants implies that up to 50 per cent of all cationic and amphoteric surfactants could be subject to bans.
17. However, in addition are those surfactants which are currently permitted but which, even though they passed the primary test, would not receive derogation following risk assessment. The number compares with our assumption that 54 surfactants would be subject to risk assessment. It is reasonable to assume that risk assessments will only be undertaken where manufacturers are confident that the result will be positive. We are therefore left with the 552 surfactants that we have assumed would be voluntarily removed from the market by manufacturers, rather than subjecting them to the testing and assessment regime. This suggests that the EC might have underestimated the extent to which the new regime might deter manufacturers from seeking approval to continue marketing their products.
18. The surfactants most likely to fail the testing regime are expected to fall into the following groups: Alkyl Sulphonsuccinate; AEO (C10+C13)(2-20EO) Branched; Alkyl EO/PO-OH or capped; Alkyl EO/BO-OH or capped; Fatty acid alkanolamides; Mono (C8-18); Fatty acid alkanolamides; Di (C8-18); Fatty acids MEA ethoxylated; Alkylamine ethoxylates (all); Fatty acids DEA ethoxylated; Dialkyl dimethyl quat (C18); Benzyl dimethyl quats; Imidazoline derivatives; Guerbetalcohol EO/PO-(all); Alkylated sulphonated Diphenyloxide; Alcohol ethoxylates >20EO; Alkylated aminoxides.
19. It is difficult to estimate the likely cost of developing alternative products. Consultation suggests that reformulations of detergent products might be relatively simple, costing a few thousand pounds only, or quite complex, with a cost closer to £50,000. The development of completely new surfactants, however, would appear to be significantly more expensive, with respondents giving estimates of between £250,000 and £750,000 per product. These latter costs are high enough to make development of new products in response to bans unlikely.

20. We have been informed by some manufacturers that there have been no new surfactants introduced onto the market for several years, making the development of new surfactants unlikelier still. The question then is how many product reformulations will be required if 552 surfactants are banned or otherwise removed from the market. Even the most conservative estimate, that each surfactant is used in a single formulation, could result in costs of between **£2.76m** and **£27.6m**. Clearly, these costs could increase significantly if several formulations are dependent on a single surfactant. Even if the surfactants that disappear have ready substitutes, reformulation is still likely to entail some costs. Even if unit costs are low, the large number of instances in which they are incurred means that total costs are likely to be considerable. These figures are, however, very tentative.
21. The Commission's Technical Guidance Document will ensure that a step-wise approach will be taken to the collection of information. In this way, the costs of collecting unnecessary or irrelevant information should be avoided, and alternatives will only need to be developed for those products for which it can be clearly demonstrated that the risks of use outweigh the benefits.

### **Costs to consumers arising from lack of product availability**

22. Costs to commercial and welfare sectors (i.e. those engaged in machine washing, bottle washing, dish washing, metal cleaning, floor cleaning, transportation cleaning, façade cleaning) if effective and appropriate specialist cleaning products are withdrawn from the market or are replaced by more expensive alternatives are similarly difficult to anticipate. Consultation suggests that, even where substitutes are readily available, costs are likely to increase and/or effectiveness may be reduced. In many cases, respondents felt that good substitutes would not be readily available. However, without detailed information on patterns and price elasticities of demand, it is not possible to make an estimate of the size of these costs.
23. The Regulation imposed other costs on manufacturers related to the provision of information, such as the need to alter product labels. These costs were included in the Regulatory Impact Assessment that accompanied the Detergents Regulations 2005. However, these costs have not changed, and are therefore not included here, as they will not be affected by the Detergents Regulations 2008, and have no bearing on the need to apply for a derogation.
24. As mentioned above, the derogations costs, except those relating to application fees, were also included in the previous Regulatory Impact Assessment, but have been included here for convenience. They do not represent an additional cost since the coming into force of the Detergents Regulations 2005. The only additional costs are the fees themselves, potentially totalling £216,000.

**Table 1: Total Compliance Costs to businesses**

Costs of testing for ultimate biodegradability	£8.1m-£13.5m
Costs of testing for primary biodegradability, derogations and risk assessment	£2.745m
Costs of derogation application fees	£216,000
Costs of alternative product development	£2.76m-£27.6m
<b>Total</b>	<b>C£14.2m-c£44.2m</b>

25. This estimate does not take into account economies of scale, or the proportion of surfactants that would be classed as disinfectants under the Regulation and hence not be subject to its requirements. The costs would also be spread over at least two years. However, it includes no allowance for the costs of formula piracy (assumed to be relatively low), and costs to consumers from restricted product availability. There is also considerable uncertainty surrounding some of the components of the estimate.

### Costs for a typical business

26. The range of business sizes in the soap, detergent and cleaning and polishing sectors is estimated as follows: (1999 estimates)

**Table 2: Range of business size**

Size of firm (no employees)	Number of businesses	Total Employment	Turnover (£m)
1-9	425	1,000	158
10-49	130	3,000	289
50-249	60	7,000	558
250+	35	31,000	5,119

27. Because of the range of size of firms in this sector, and the diversity of products produced, it is only possible to give a rough approximation of the cost for a 'typical business'.
28. All surfactant manufacturers in the sector will be faced with the costs of ultimate biodegradability testing (£3,000 - £5,000) per surfactant (unless their surfactants have already been tested). A common approach within the sector may help to develop economies of scale in testing and optimum utilisation of outstanding testing capacity. Such an approach may help smaller producers.
29. Costs beyond those of ultimate biodegradability testing will depend on which surfactants are used, what alternatives are available, and whether the firm decides to pursue the derogation route for surfactants that fail the ultimate biodegradability test.
30. As a very crude gauge, the total number of businesses in the sector (650) divided by the total compliance cost estimates results of around **£45,000 – £90,000** per business. This provides a first estimate but, as has been suggested, costs are likely to be incurred disproportionately by smaller firms, although, in absolute terms, costs will be higher for larger operators. Costs to surfactant manufacturers may be higher than this, as the figure of 650 businesses includes downstream formulators. While downstream formulators will be responsible for ensuring that their detergents contain compliant surfactants, it is likely that the surfactant manufacturer will commission the actual testing.

### 'Small Firms Impact Test'

31. Regulation 648/2004 and the Detergents Regulations 2008 (will) apply to all manufacturers and suppliers of detergent products. However, consultation with trade associations in 2001 suggested that they would impact primarily on SMEs manufacturing and supplying products that fall outside the existing biodegradability testing requirements, in particular, those producing cationic and amphoteric surfactants. The businesses affected operate in the soap, detergent and cleaning and polishing sectors and supply products involved in machine washing, bottle washing, dish washing, metal cleaning, floor cleaning, transportation cleaning and façade cleaning.
32. Trade associations contacted by the DTI who responded to the Commission's consultation included the United Kingdom Cleaning Products Industry Association (UKCPI), the British Association for Chemical Specialties (BACS) and the Chemical Industries Association (CIA). In addition, European industry bodies such as Comité Européen des Agents de Surface et leurs Intermediaires Organiques (CESIO) and Association Internationale de la Savonnerie, de la Détergence et des Produits d'Entretien (AISE) responded at a European level. As well as representing large multinational companies and other trade associations, these bodies also represent SMEs operating in niche markets.



33. The trade associations welcomed the revision of the legislation as it was in line with their policy of promoting the use of biodegradable surfactants where possible. However, concerns were expressed regarding the timescale for implementation of the Regulation, particularly the length of time that a company would have in which to apply for a derogation, and the phase-out period that would exist if a surfactant were not granted a derogation, while new products were developed and stock already on the market was sold. Industry also felt that the Regulation could lead to the withdrawal of several effective, small volume surfactants used in the industrial and institutional sector.
34. Since 2001 the UK Government and the Commission have maintained regular contact with industry. Defra conducted public consultations in 2003 and 2005-06, on which the costs in this RIA are based. Trade associations such as AISE and CESIO have been heavily involved in the production of technical guidance documents.
35. A possible scenario would be a small firm that uses 12 surfactants in its products. The cost of submitting these to the ultimate biodegradability test would be:
- $$12 \times (\pounds 3,000 - \pounds 5,000) = \pounds 36,000 - \pounds 60,000$$
36. Assuming that a third of the surfactants fail the ultimate biodegradability test, the producer has the option of submitting the failed surfactants to the primary biodegradability test with a view to seeking derogation. If the producer decided to submit all of the products for testing then, depending on whether screening of confirmatory tests were needed, the costs would be:
- $$4 \times (\pounds 2,000) = \pounds 8,000, \text{ or}$$
- $$4 \times (\pounds 8,000 - \pounds 10,000) = \pounds 32,000 - \pounds 40,000$$
- If the manufacturer were required to establish further testing methods then this would add a further **£40,000** per product.
37. The manufacturer would also be obliged to undertake risk assessments on those projects for which he was seeking derogation. The cost of undertaking these would be:
- $$4 \times (\pounds 50,000 - \pounds 250,000) = \pounds 200,000 - \pounds 1\text{m}$$
- Finally, there would be development costs to find alternative surfactants. This is difficult to estimate but a notional **£50,000** per product is suggested.
38. There is a view within the industry that there will be few applications for derogations, as an application would represent a significant economic outlay and may well not be granted. This view was confirmed by manufacturers and trade associations in PSD's consultation, which ran from November 2005 to February 2006. This could be particularly true in the case of SMEs. However, industry was unable to provide precise figures on the number of derogation applications that are likely to be received.
39. Industry was also unable to provide precise figures on the percentage of SMEs operating in the industrial and institutional market. It has also been suggested by one manufacturer that larger quantities of less effective surfactants passing ultimate biodegradability might be used to replace those smaller volume surfactants that were not granted a derogation, instead of developing alternative surfactants. This appears to have been borne out by the fact that to date no applications for derogations have been submitted to PSD.

### **Competition assessment**

40. The Regulation has created a variety of costs for business, which, in the main, will arise from requirements relating to ultimate biodegradability tests, primary biodegradability tests,

complimentary risk assessments and costs arising from seeking alternative product development. The extent of these costs for individual businesses will be largely dependent upon the extent to which businesses have already incorporated the ultimate biodegradability testing into their process and whether the business produces surfactants which would fail the ultimate test and the numbers of these.

41. The intention is that most surfactants would only be subject to a single test. However, if a surfactant fails the ultimate test, it is possible that additional tests might be necessary. This might require that the product be subject to a period of derogation, removal or necessitate the development and use of an alternative product. Following consultation with trade bodies, it is anticipated that the effect of the Regulation will be relatively greatest on small firms in the industrial and institutional detergents sector, where they produce low tonnage specialist surfactants (detergents), which could be more likely to fail the initial biodegradability test.
42. Surfactants failing the ultimate biodegradability test and therefore being subjected to primary biodegradability tests and complimentary risk assessments are likely to be confined to distinct separate markets. As stated previously it is likely that the industrial and institutional sector will be most significantly affected by additional testing requirements. However, the effects felt by SMEs in relation to increased costs associated with the risk assessment process are likely to be more disproportionate than those felt by larger manufacturers.
43. It is also important to note that the Regulation may result in a potential competitive disadvantage for EU producers of surfactants in non-EU markets where surfactant manufacturers are not faced by additional testing requirements. This might come from an overall increase in costs of EU producers relative to non-EU producers. The potential size of this effect will depend on the extent of EU-non-EU trade, since only products manufactured in the EU but exported to non-EU markets will be subject to a potential cost disadvantage. Information has not been obtainable on the extent of this trade.
44. The majority of surfactant manufacturers tend to produce a broad range of products, and, therefore, although some surfactants may fail testing requirements, alternative income streams will go some way to cushioning any negative effects from the proposal. Although some specialist manufacturers of surfactants may be affected, it would be reasonable to assume that their exit from the industry would not greatly affect the level of concentration or market structure, as the industrial and institutional sector of the European detergents market was estimated to be worth 5 Billion euro in 2001. That having been said, it is unlikely that any manufacturer would have to close as a result of the Regulation, as consultation suggests that few if any manufacturers manufacture surfactants solely for the industrial and institutional sector. Therefore, it would be reasonable to assume that the Regulations should not have a significant effect on competition at this level.

#### Annex J: Glossary of terms

<b>Term</b>	<b>Definition</b>
<b>Aerobic testing</b>	Testing biodegradability in the presence of oxygen
<b>Anaerobic testing</b>	Testing for biodegradability in the absence of oxygen.
<b>CHIP</b>	The Chemicals (hazard information and packaging for supply) Regulations 2002.
<b>Derogation</b>	If a surfactant used for industrial or institutional purposes fails the ultimate biodegradability test but passes the

	primary biodegradability test, a manufacturer can apply to the Member State and the Commission for a derogation to keep the surfactant on the market.
<b>Detergent</b>	Detergent is defined in article 2 of Regulation 648/2004 as: <i>“Any substance or preparation containing soaps and/or other surfactants intended for washing and cleaning purposes. Detergents may be in any form (liquid, powder, paste, bar, cake, moulded piece, shape etc.) and marketed for or used in household, or institutional or industrial purposes.”</i> In addition, auxiliary washing preparations, laundry fabric-softeners, cleaning preparations and washing preparations are considered as detergents.
<b>False negatives</b>	Results that wrongly show a surfactant to have failed a biodegradability test. The test methods for primary biodegradability contained in the existing legislation are said to be unreliable and false negatives occur.
<b>Primary biodegradation</b>	Where only the active properties of the surfactant are degraded. The minimum biodegradation level is set at 80%
<b>Regulation 648/2004</b>	Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents
<b>Surfactant</b>	The active cleaning ingredient of a detergent. Surfactants have one end that is hydrophilic (clings to water and avoids oil) and one end that is hydrophobic (clings to oil and avoids water); this makes them effective dirt removing ingredients in detergents. There are four groups of surfactants: <ul style="list-style-type: none"> <li>• Non-ionic</li> <li>• Anionic</li> <li>• Cationic</li> <li>• Amphoteric. Non-ionic and anionic surfactants were covered by the legislation that this Regulation revokes.</li> </ul>
<b>Technical file</b>	A file that must accompany a derogation application, containing results from the ultimate and primary biodegradation tests, and a complimentary risk assessment.
<b>Ultimate biodegradation</b>	Where the whole surfactant molecule (not just the active part in the environment) is degraded resulting in its breakdown to carbon dioxide, water and mineral salts. To pass the ultimate biodegradability test, mineralisation of the molecule must reach either 60 or 70% within 28 days, depending on the test method used.

## **Annex 2**

### **Impact Assessment for a phosphate ban in Domestic Laundry Cleaning Products (DLCPs)**

<b>1. Summary: Intervention &amp; Options</b>		
<b>Department /Agency: Defra</b>	<b>Title: Impact Assessment of Ban on Phosphorus In Domestic Laundry Cleaning Products</b>	
<b>Stage: Final</b>	<b>Version: 21</b>	<b>Date: 21th Sept 2009</b>
<b>Related Publications:</b> Consultation on options for controls of phosphorus in domestic Laundry cleaning products in England. February 2008		

Available to view or download at:

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**What is the problem under consideration? Why is government intervention necessary?**

Almost half of the rivers in England and Wales do not meet the Water Framework Directive phosphorus standard for Good Status. Phosphorus pollution can cause eutrophication. The most significant sources of phosphorus are sewage works, agriculture and diffuse pollution such as misconnections, storm overflows and small scale sewage treatment. Domestic laundry cleaning products contribute 3-4% of phosphorus pollution load to the freshwater environment. A ban will contribute to the reduction of phosphorus pollution and reduce the energy and chemicals used by the water industry in phosphorus removal from sewage effluent. The impacts on the water environment and the costs imposed on water companies to deal with phosphorus from detergents are external costs imposed by domestic laundry cleaning product manufacturers on society. Intervention is needed address these costs.

**What are the policy objectives and the intended effects?**

The objective of the policy is to contribute to the reduction of phosphorus in the WFD aquatic environment in the most cost-effective manner. The reduction of phosphorus from this policy alone will not significantly alter compliance with phosphorus objectives but together with other phosphorus reduction measures is an important step in improving water quality. The resultant reduction in the use of resources for sewage treatment will reduce costs and the environmental impact of the treatment process. The policy would also apply the polluter pays principle in stopping pollution at source.

**What policy options have been considered? Please justify any preferred option.**

Policy options: 1) Reference case, 2) Voluntary ban on sales of DLPS containing significant amounts of phosphate 3) Ban on sales of all DLCPs containing more than 0.4% phosphorus by 2015.

The preferred option is (3) as this will reduce phosphorus pollution at source and implement the polluter pays principle. The voluntary option was rejected by industry and was therefore not considered in detail in this impact assessment.

**When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?** 2020 - to allow time for environmental effects to be confirmed by Environment Agency monitoring

**Ministerial Sign-off** For final proposal/implementation stage Impact Assessments:

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister:

..... Date:

## 2. Summary: Analysis & Evidence

<b>Policy Option: 3</b>	<b>Description: Regulation on the phosphorus content of domestic laundry cleaning products</b>
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<b>COSTS</b>	<b>ANNUAL COSTS</b>	Description and scale of <b>key monetised costs</b> by ‘main affected groups’ the affected groups are manufacturers of domestic laundry cleaning products containing phosphorus and their customers who will bear the costs of the change. These costs assume reduction to at least 0.4% of phosphorus for all DLCPs.
	<b>One-off (Transition)</b> Yrs	
	<b>£ 10-15 million</b> 15	
	<b>Average Annual Cost (excluding one-off)</b>	
	<b>£ 5-8 million</b>	
<b>Total Cost (PV)</b>		<b>£ 68-107 million</b>
Other <b>key non-monetised costs</b> by ‘main affected groups’		

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>	Description and scale of <b>key monetised benefits</b> by ‘main affected groups’ Savings to water companies - they will use less energy and chemicals in the removal of phosphorus from sewage effluent. Environmental benefits - less phosphorus will be discharged to rivers reducing phosphorus pollution and allowing more WFD objectives to be achieved (See Annex 3 on Cost
	<b>One-off</b> Yrs	
	<b>£ 3 million</b> 15	
	<b>Average Annual Benefit (excluding one-off)</b>	
	<b>£ 5 – 10 million</b>	
<b>Total Benefit (PV)</b>		<b>£ 59-123 million</b>
Other <b>key non-monetised benefits</b> by ‘main affected groups’ A reduction in phosphorus pollution in most rivers and still waters. It is not possible to monetise this benefit but it will certainly contribute towards improving the aquatic environment and achieving water quality objectives. Some sites not specifically monitored for phosphorus will benefit significantly.		

**Key Assumptions/Sensitivities/Risks** Industry costs are difficult to determine due to commercial confidentiality - the costs are estimates based on figures provided by the water industry. The benefits to the environment are difficult to determine because of the unpredictable way that phosphorus can

Price Base Year 2008	Time Period Years 15	<b>Net Benefit Range (NPV)</b> <b>£ -48 to £56 million</b>	<b>NET BENEFIT (NPV Best estimate)</b>
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What is the geographic coverage of the policy/option?		England and Wales			
On what date will the policy be implemented?		2015			
Which organisation(s) will enforce the policy?		To Be Finalised			
What is the total annual cost of enforcement for these organisations?		£ Negligible			
Does enforcement comply with Hampton principles?		Yes			
Will implementation go beyond minimum EU requirements?		No			
What is the value of the proposed offsetting measure per year?		£			
What is the value of changes in greenhouse gas emissions?		£			
Will the proposal have a significant impact on competition?		No			
Annual cost (£-£) per organisation (excluding one-off)		Micro	Small	Medium	Large
Are any of these organisations exempt?		No	No	N/A	N/A

<b>Impact on Admin Burdens Baseline (2005 Prices)</b>					<b>(Increase - Decrease)</b>
Increase of	£	Decrease of	£	<b>Net Impact</b>	£

Key: Annual costs and (Net)

### 3. Evidence Base (for summary sheets)

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

## 1 What is the problem under consideration? Why is government intervention necessary?

### Summary

1. The problem under consideration is the pollution of the aquatic environment with phosphorus compounds. Phosphorus is a plant nutrient normally found in limited amounts in freshwater -this restricts the growth rate of plants and algae in freshwater. If phosphorus compounds pollute freshwater, this allows plants to grow in unnatural abundance -choking water courses and damaging ecology. Sometimes fish and other aquatic species are killed , as plants use up oxygen when they die off. This type of plant growth is called eutrophication. Eutrophication can also cause aesthetic problems due to formation of algal mats and unpleasant smells due to plant decay and make water unusable for a variety of purposes.
2. Eutrophication in freshwater can be limited by the control of phosphorus compounds commonly phosphate.
3. Domestic Laundry Cleaning Products (DLCP) are a source of phosphorus pollution.
4. This proposal is aimed at reducing phosphorus pollution by implementing a ban on the sale of DLCP containing more than 0.4% phosphorus by weight.
5. This policy would provide benefits in two ways:
  - Improving water quality through a reduction in phosphorus pollution to the aquatic environment thereby achieving water framework directive objectives and;
  - Reducing the energy and chemicals water companies use to remove phosphorus from the effluent of sewage treatment plants.
6. Dishwasher detergents have not been included in the proposals for a ban on phosphorus because it would be far more difficult for industry to produce dishwasher detergents which would be effective without phosphate compounds.
7. The net benefit is very small and considering estimates made this proposal can be regarded as cost neutral.

### Total Loads of Phosphorus

8. There are many sources of phosphorus in the aquatic environment. A small amount comes from geological sources but the majority in the freshwater environment comes from pollution. The most significant sources of pollution are sewage effluents and agriculture.
9. A study commissioned by DEFRA in 2006<sup>1</sup> estimated the phosphorus load to waters as:
  - Total phosphorus (TP) to England, Wales and Scotland = 41,600 tonnes per year
  - Soluble reactive phosphorus (SRP) to England, Wales and Scotland = 31,300 tonnes per year.
10. The findings of this study are illustrated in figure 1 below.

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<sup>1</sup> P.J. White and J.P. Hammond, 2006 - Updating the Estimate of the Source of Phosphorus in UK Waters.



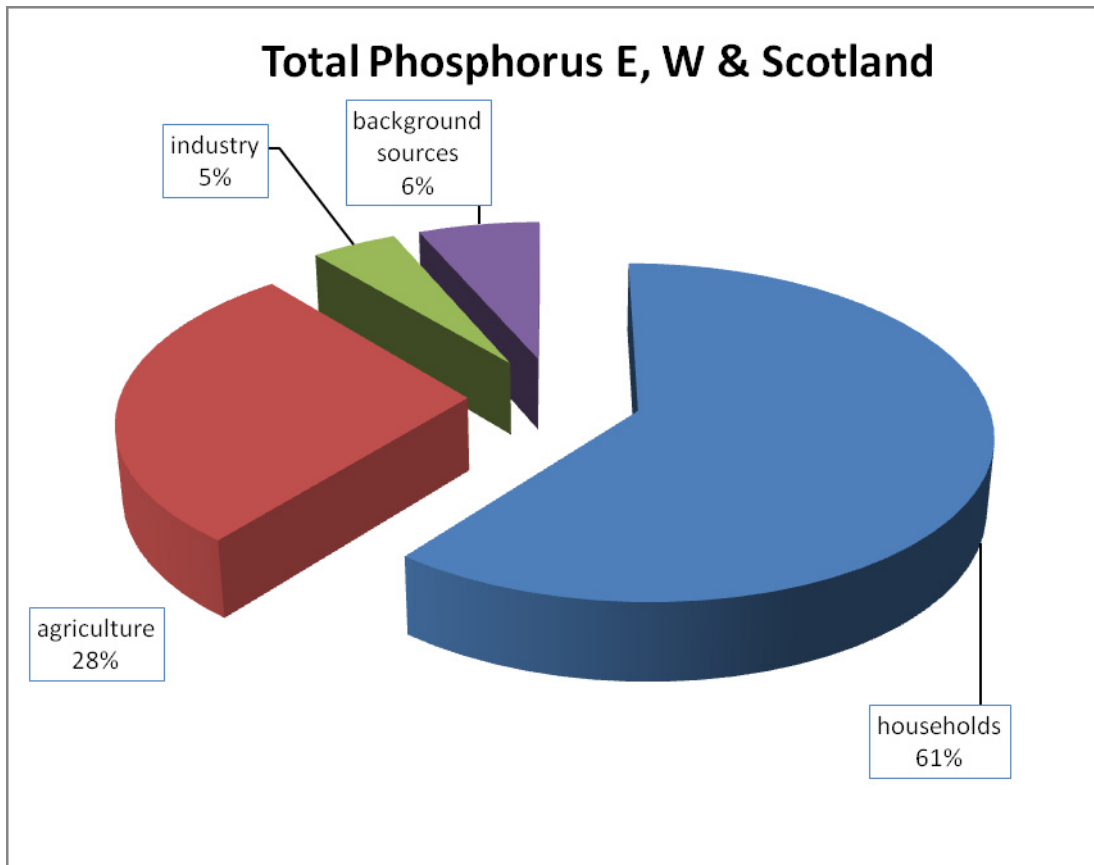


FIGURE 1 SOURCES OF PHOSPHORUS LOAD TO THE WATER ENVIRONMENT

### The Contribution of DLCP phosphorus to the Environment

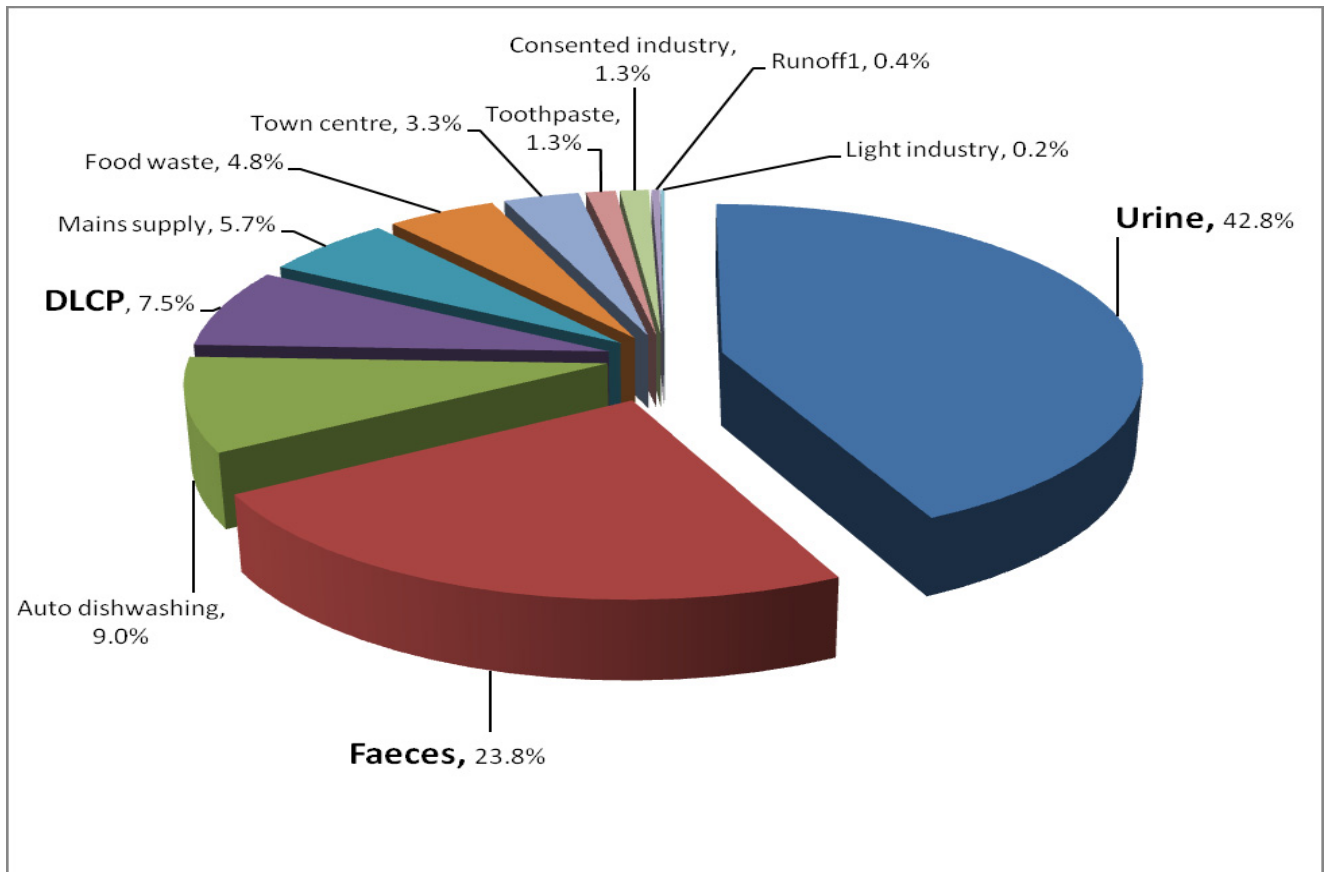
11. Given that 41,600 tonnes of phosphorus is discharged to England, Wales and Scotland each year and the population of England and Wales is 53 million and Scotland 5.1 million<sup>2</sup>, then the phosphorus load for England and Wales is 37,900 tonnes per year.
12. The detergent industry estimates around 3000 tonnes per year of phosphorus is used in DLCP. We have calculated that 1356 tonnes per year of this DLCP phosphorus is discharged to the environment (see Annex 1). This is 4% of the soluble reactive phosphorus discharged to the waters of England and Wales and 3% of the total phosphorus.

### The Contribution of DLCP phosphorus to sewage treatment works

13. Domestic laundry cleaning products contribute 7.5% of phosphorus in domestic sewage (household category in fig 1). This figure was agreed by a working group on phosphorus in DLCP. The group included members of the cleaning products industry, the water industry, DEFRA, OFWAT and CEEP<sup>3</sup>. The way this value was calculated is shown in Annex 1. DLCP also contribute a small proportion to background sources in figure 1, through storm discharges and misconnections.
14. Further work will be done in Defra on the economics of the nutrient cycle as part of this the phosphate cycle will be considered. This work will strengthen the evidence base for the phosphate cycle and allow us to further investigate appropriate targets for reduction of this pollutant.

<sup>2</sup> Scotland official online gateway statistics for 2006

<sup>3</sup> Centre Europeen d'Etudes des Polyphosphorus



**FIGURE 2**  
**SOURCES OF PHOSPHORUS IN DOMESTIC SEWAGE IN SEWAGE TREATMENT WORKS<sup>4</sup>**

### Phosphorus Water Quality Objectives

15. The Water Framework Directive has a series of phosphorus targets for freshwater based on concentrations of phosphate. The value varies depending on the type of water body. Almost half of the water bodies in England and Wales fail to meet their phosphate objectives.

### Tackling Sources of Phosphorus

16. There are a number of sources of phosphorus load to freshwater- the major contributor is household sewage. By 2010, at the end of the current water company asset management plan, water companies will have spent £1.5 billion on capital costs for treatment plants which will reduce phosphorus in sewage effluent. There are economic limits to technology which is used to treat sewage. Discharges from sewage plants usually aim to meet a concentration of 1 or 2 mg/l of phosphorus in the effluent of a plant using specialised phosphorus removal. So there is still a significant amount of phosphorus discharged from larger sewage works even with phosphorus removal plant. Most sewage works of a significant size, in areas where phosphorus standards are being breached, already have phosphorus removal plants in place or planned.

17. Agriculture is also a major source of phosphorus in freshwaters. Catchment sensitive farming is one approach to reducing phosphorus emissions – it is a programme which advises farmers how to reduce pollution. Another initiative is the use of water protection zones. However it is not clear what these zones would be, or what actions would be taken to reduce phosphorus pollution.

<sup>4</sup> Diagram constructed using figures from "Review of potential cost savings to the water industry should phosphorus be removed from DLCP. Atkins Dec 2008. Errors in the report were corrected prior to production of the figure.

18. Approaches to the reduction of pollution from other sources are also being considered. Sustainable drainage (SUDS) will reduce pollution from urban runoff; action on misconnections to foul sewers will reduce the contribution of misconnections to phosphorus pollution.
19. P removal at the major source of phosphate – sewage works is already being tackled as quickly as possible through the water industry asset management plans. Major expenditure has been allocated to reduce phosphate where possible and effective.
20. Catchment sensitive farming is intended to reduce agricultural pollution including phosphate from fertilisers in selected catchments and water protection zones are to be introduced in key catchments to further reduce pollution including phosphate pollution. Pilot WPZs are to be consulted on in 2010.
21. However none of these methods to reduce phosphate will allow all water framework directive phosphate targets to be met. All reductions of phosphate are needed to contribute to a reduction in this form of pollution.
22. Reduction of phosphate in detergents also has the advantage that it is reduction at source and will reduce the load of phosphate going to sewage works, thereby reducing the energy and chemicals needed to treat sewage. This contributes to the polluter pays principle and introduced a greater measure of fairness in the burden for reduction of phosphate pollution. Where previously the water customer would pay for the removal of detergent phosphate now the detergent industry and customers will pay.

#### **What will a DLCP phosphorus ban achieve?**

23. A ban of phosphorus in DLCPs may not make a large contribution to the reduction of phosphorus in the environment - a reduction of 3% phosphorus to freshwater might be achieved. However, this is a important reduction in phosphorus pollution; each decrease in phosphorus pollution moves us towards compliance with water framework directive objectives. In some areas this reduction will, by itself, allow compliance with water framework directive objectives. In other areas it will move phosphorus concentration towards the objective in concert with other phosphorus reduction initiatives.

#### **2 What are the policy objectives and intended effects**

24. The policy objectives are to reduce phosphorus pollution in the environment in the most effective way.
25. The intended effects are:
  - An improvement of the aquatic environment
  - Improved compliance with water quality objectives
  - A reduction in the phosphorus content of sewage and therefore a reduction in the power and chemicals used for sewage treatment

#### **3 What policy options have been considered? Please justify any preferred option**

##### **Factors considered in formulation of options**

##### **Timing**

26. The timing of this policy implementation should tie into the Water Framework Directive (WFD) – action on failures of water bodies to reach compliance with Good Status is required by the WFD. We are aiming to reach WFD objectives by 2015.
27. In preparing this impact assessment, industry was asked to give its opinion on how quickly it could move to comply with a ban on phosphorus and for which product groups this could be done. The industry believes that a phasing-out of significant amounts of phosphorus in DLCP could be completed by 2015.

### **Small And Medium Enterprises**

28. The effects of a ban on small to medium- sized enterprises (SMEs), was considered in the formulation of options. However, discussions with UKCPI and BERR concluded that there are no SMEs in the UK which would be significantly affected by this ban. Detergent industry representatives<sup>5</sup> suggested that SMEs make up a small or negligible proportion of manufacturers of DLCP containing P. So we did not consider any options which would involve taking account of SMEs.

### **Geographical Extent**

29. The problem caused by phosphorus in detergents could be controlled in particular priority catchments, so a catchment approach was considered in comparison to a national approach. However, discussions with the cleaning products industry indicated that a ban of phosphorus in DLCP at a local level would not be workable so this factor has not been considered further.

### **Options in terms of product groups**

30. The main emphasis has been on the DLCP product group. Non-domestic laundry cleaning is not considered to be a major contributor of DLCP phosphorus - to include this use in restrictions on phosphorus use would be too great a risk in term of effects on laundry businesses.
31. The pCEA analysis also excluded dishwasher detergents from the analysis, based on the fact that bans in other Member States have typically excluded this source, despite alternatives being available on the market. According to the cleaning products industry, the main issues with P-free dishwasher detergents are; wash performance (cleanliness and sanitisation) and the energy and water consumption resulting from possible changes in programme-use by consumers to compensate for lower performance<sup>6</sup>.
32. These differences in performance may result in extra costs for the consumer, and environmental impacts, in particular greenhouse gas emissions relating to increased energy use. There are, however, P-free machine dishwasher products already available. This suggests that this is not an issue for at least some of the population, for example those in soft water areas.
33. We spent almost 18 months in detailed negotiations with the detergent industry and the water industry and the voluntary option was discussed at various times but clearly would not work because of the industry structure (See below option 2).
34. Various other options were discussed during the policy cycle including options on timing (waiting until after possible European legislation) and scope (whether or not to include dishwasher products as well). The implementation of European legislation is not certain and almost certainly could not be implemented in time to aid in meeting water framework directive targets. A ban of phosphate in dishwasher detergents was rejected by the industry because of the lack of a suitable alternative to phosphates, since zeolites can abrade glassware, rendering it cloudy. We made the decision that a ban on phosphorus use in dishwasher detergents would require further research and a separate impact assessment, as we currently have insufficient data on this issue. So all other options have now been rejected.

### **OPTION 1 Reference case business as usual**

35. Business as usual (BAU) considers the outcome if the government does nothing specific in relation to phosphorus in DLCP. All actions are taken to meet the Water Framework Directive (WFD) standards with the exception of the controls on phosphorus in DLCP.
36. Evidence shows that the phosphorus content of DLCP has declined since the 1980s. Figures from the UK Cleaning Products Industry suggest that phosphorus use in DLCP fell

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<sup>5</sup> UKCPI

<sup>6</sup> UKCPI

by about 90% from the 1990s to 2008. This is partly attributed to changes in products, particularly the increased use of liquids in laundry cleaning, but it is also due to a shift by manufacturers from phosphorus-use to substitutes. This is due to UK public awareness of the problems nutrients can cause in the environment and phosphorus bans in several European countries<sup>7</sup>.

37. Phosphorus is a problem for a wide range of other member states and action at European level is being considered by the European Commission. However, the European Commission is not certain to take action on phosphorus in detergents and may be content for individual member states to take action unilaterally, where it is seen to be more of a problem. If the EU decides to legislate in the future, we will have to work to ensure that EU and UK legislation are compatible. If we are to meet Water Framework Directive requirements it is not certain that EU legislation on a phosphorus ban would be introduced in time to fulfil this requirement.
38. So using the BAU option, we could see a reduction in phosphorus use and a ban on phosphorus imposed by the European Commission. However, neither of these outcomes is certain.

### **OPTION 2 Voluntary Ban option**

39. Government could seek to work with the cleaning products industry on a voluntary basis to reduce, or eliminate phosphorus in DLCP over and above what would be achieved by the BAU option. However, having discussed this option with UKCPI, it was clear that the detergent manufacturing industry were not at all in favour of this and would not implement it. They were concerned that a voluntary option would open the door to market distortion allowing companies who opted-out of the voluntary agreement to take some of the market share from those who did comply with such an agreement.
40. We decided not to pursue this option further or in more detail in this impact assessment, as it was clear that a voluntary option would not be accepted by industry and would not work. So this option was not costed.

### **Option 3 Regulatory Ban option**

41. This option is a regulatory ban on the sale of DLCPs containing phosphorus. It would ban sales of DLCP containing significant amounts of phosphorus. The ban would cover sales to the domestic market.
42. A common replacement for phosphorus compounds in DLCP is zeolite – this is used in conjunction with polycarboxylates. Neither zeolites<sup>8</sup> nor polycarboxylates<sup>9</sup> have been found to be harmful to humans or the environment. These replacements for phosphorus compounds in detergents have been used routinely in DLCP since the 1980s<sup>10</sup>. We are, however, waiting for a report from the European Commission on the phase-out of phosphates and the health and environmental risks of its substitutes.

## **4 Costs**

43. Evidence suggests that the compliance costs of switching to phosphorus free DLCP is not likely to be high. Information from the detergent industry suggests a cost of £5 – 8 million per annum and one-off costs of £10-15 million for the UK. This is based on a small

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<sup>7</sup> **Europe** – Italy, Belgium, Czech Republic, France, Germany, and the Netherlands have already adopted legislation to reduce or ban phosphorus in detergents with the aim of reducing eutrophication. Sweden has recently announced their intention to do likewise. Austria, Ireland, Denmark, and Finland rely on voluntary commitments by detergent formulators to phase-out phosphorus-based detergents. Seven Member States have only phosphorus-free laundry detergents

<sup>8</sup> Human & Environmental Risk Assessment on ingredients of household cleaning products Supplement to the HERA report on the Environmental Risk Assessment of Zeolite A Edition 1.0 September 2005

<sup>9</sup> Human & Environmental Risk Assessment on ingredients of European household cleaning products. Polycarboxylates used in detergents Polyacrylic acid homopolymers (CAS 9003-04-7), Poly- (acrylic/maleic) acid copolymers (CAS 52255-49-9) and their sodium salts. Sept 2007

<sup>10</sup> Polyphosphorus, Zeolite A and Citrate in Detergents Technical and Environmental Aspects of Detergent Builder Systems - Kemisk-Tekniska Leverantörförbundet Stockholm Dec 1996

investment cost at each site to reformulate and amend processes.<sup>11</sup> Most, if not all manufacturing is in England and Wales - so the cost can be applied directly to this impact assessment. In comparison, the revenue of the domestic laundry washing products industry for the UK is approximately £1.2 billion per annum - £850 million is attributable to clothes-washing products.

44. Many laundry detergent producers are already manufacturing phosphorus free products and would not experience capital costs. Others already have production facilities which manufacture both types of DLCP as they trade in countries with different requirements in terms of the levels of phosphorus in detergents. Different dosing equipment may be required as alternatives to phosphorus compounds tend to be smaller. There may also be a need for research and development to support the switch.
45. International manufacturers are already exporting to a variety of markets with different marketing controls on phosphorus in detergents. It is unlikely these firms will be adversely affected by the controls.
46. Smaller manufacturers of local or niche products. They would face greater problems, as they lack the technical capability to make the changes – or are tied to particular production facilities/techniques. But industry advice is that there are no significant numbers of small enterprises (if any) making DLCP containing phosphorus. The timing of the ban should allow at least three years to implement changes. This should be sufficient for any detergent manufacturers to change formulations.
47. It has also been suggested that there are some costs associated with the use of alternatives to P. The alternative substances would not be subject to water quality regulation and would not drive additional compliance costs in STW. They may give rise to additional sludge in areas where phosphorus removal is not installed but this is not considered to be significant (in the context of the other costs for STW). Phosphorus and non-P based laundry detergents have similar performance standards (not the case for dishwasher detergents) and as a result it is not expected that there would be any change in consumer behaviour (e.g. the frequency or temperature of washes). It is not expected that there would be any costs specifically associated with the use of alternative formulations or products.
48. When considering the costs of a ban and the effects of substitutes, it is important to realise that 80—90% of DLCPs are already phosphate-free or low in phosphorus and already incorporate substitutes.

## 5 Benefits

### WFD

49. There are benefits to reducing phosphorus discharges to the environment. Although the exact figure is unknown, a very significant proportion of the Water Framework Directive benefits- £0.65 to £1.7 billion per annum, are likely to be dependent upon reduction in the amount of phosphorus in freshwaters<sup>12</sup>.
50. The benefits of reducing phosphorus pollution from DLCP should not be seen in isolation. They arise from the role that controls on phosphorus in DLCP play in a wider strategy to manage phosphorus in catchments – with the majority of control having to be undertaken by the Water Industry and Agriculture. The benefits cannot be delivered by the action of one sector in isolation. It is a specific requirement of the WFD to identify the most cost-effective programme of measures for achieving the Directive's objectives. Preliminary analysis undertaken for the water framework directive (pCEA) indicates that controls on phosphorus in DLCP should play a role in the overall programme of measures for nutrients. The extent of that control is partly addressed in this impact assessment, but also needs to be addressed in the River Basin Management Plans. This will, determine how quickly

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<sup>11</sup> Based on information provided by UKCPI

<sup>12</sup> <http://www.wfdcrp.co.uk/pdf/5CCRPSG%204bdc%final.pdf>

progress is made towards achieving a good ecological status and which water bodies are the subject of less stringent environmental objectives.

- - 
  - **Benefits from the Ban on Phosphorus (Option 3)**
51. As discussed in section 2 there are two types of benefits which will be produced by a ban on phosphorus in DLCP.
    - Environmental benefits due to the reduction of phosphorus pollution in the aquatic environment and;
    - A reduction in the phosphorus removal requirement in sewage treatment plants.
  52. Benefits to the aquatic environment occur where phosphorus pollution to freshwaters is reduced. The ecology of estuarine and coastal waters is not normally limited by phosphorus and discharges to these waters have not been considered when looking at the benefits.
  53. The effects of phosphorus reduction were considered for discharges direct to the environment and those to sewage works where there was no phosphorus removal plant. Where sewage treatment plants have phosphorus removal systems installed, there is no reduction in phosphorus pollution, since the concentration of phosphorus discharged is not dependant on the phosphorus entering a sewage works.
  54. There are direct discharges of DLCP phosphorus to the environment through misconnections and storm overflows from sewage systems. We calculated that this would consist of 60 tonnes phosphorus per year (Annex 1). However, we do not have sufficient data to calculate a monetary benefit caused by the cessation of this amount of phosphorus pollution.

#### **Calculation of benefit due to reduction of phosphorus from sewage works**

55. This calculation considered only those sewage works where there was no phosphorus removal. It was assumed in the first iteration of this calculation that a ban would achieve a reduction of 10% of phosphorus in sewage.
56. The Environment Agency used a river quality model called SIMCAT to calculate the effect this would have on waters receiving the pollution. SIMCAT simulates the water quality in catchments using a statistical analysis of water quality and flow data and to produce results expressed in the likelihood of their occurrence. A SIMCAT model has recently been constructed for all the rivers in England and Wales. It contains information on all significant sewage works and can be used to predict the effects of their effluents on the rivers they discharge to.
57. To use this model for investigation of the effects of a phosphorus ban, the Environment Agency identified all sewage works without phosphorus treatment installed or planned, and applied a 10% reduction in effluent sewage. The model calculated that this would produce an increase in Good Status rivers of 250km.
58. The benefit of achieving Good Status in Water Framework Directive terms has been calculated by the Environment Agency<sup>13</sup>. The Environment Agency asked a consultant<sup>14</sup> to update estimates of the benefits to households in England and Wales from implementation of the Water Framework Directive. The original estimates were produced by NERA as part of a Water Framework Directive collaborative research programme.<sup>15</sup> The update uses the same modeling methods that were used for this study, but with new water body classification data provided by the Environment Agency, and a revised aggregation model that corrects an error in the previous version.

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<sup>13</sup> Updating National WFD Benefits Estimates *A Report for the Environment Agency, 3 October 2008*

<sup>14</sup> NERA

<sup>15</sup> <http://www.wfdcrp.co.uk/pdf%5CCRPSG%204bdc%final.pdf>

59. There are a range of benefits that this study applies to an achievement of Good Status. The value used was calculated for improvement from low to high quality – that is to achieve good status was £22.45k per km/yr, (WFD benefits figures range from £42.6k/km/yr – £13.3k/km/yr).
60. A revision in percentage contribution of DLCP to sewage to 7.5% in the latter stages of this impact assessment required that we reduce the estimate of the length improved, on a pro-rata basis to 190km of river. The benefits were therefore re-calculated as follows:
- 190km of river at £22.45k per km/yr- producing a mid-range benefit of £4.3 million per year.
  - The benefits were calculated over 15 years from 2012 to 2027 - the end of the first water framework directive implementation cycle.
61. Details of the cost benefit calculations are shown in Annex 3.

### **Intangible Benefits**

62. Those benefits not costed were:
- Direct discharges to the freshwater environment from storm overflows and misconnections.
  - Discharges from sewage treatment plants too small to be modelled on SIMCAT – such as septic tanks and small sewage works.
  - Any change in quality which did not lead to a class change. Some benefit will be produced by any reduction in phosphorus pollution, either due to an incremental improvement in the ecology, or by contributing to a series of actions that bring about a compliance with Good Status objectives. This benefit applies to all freshwaters but we do not have sufficient data or techniques to quantify it.
  - There may be benefits to aquatic life in estuarine and coastal waters through a reduction of phosphorus pollution. However, we have no data and there are no standards set for this parameter in the water framework directive - so benefits could not be assessed.

### **Benefits from a reduction in the phosphorus removal requirement in sewage treatment plants.**

63. The Atkins study, using information from the water industry suggests that there could be savings at existing plant in the region of £2.4 million per annum. This arises from the reduced operational costs at plants which currently have to add chemicals to incoming wastewater to remove the P. Capital costs savings are £3 million due to the reduction in the size or number of treatment plants required. This is described in detail in the Atkins report<sup>16</sup>.
64. The method involved the assessment of sources of phosphorus in sewage arriving at sewage treatment works. The results of this are shown in annex 1 table C. Once the proportion of phosphorus in sewage was established cost savings were calculated using data from 41 United Utilities sewage treatment works where phosphorus removal is undertaken. Information on the running of these plants was used to calculate the change in capital cost and running costs if a reduction of 7.5% in the incoming sewage phosphorus was achieved.
65. The results were extrapolated to all sewage treatment plants in England and Wales where phosphorus treatment is planned.

## **6 Key assumptions**

The results are sensitive to a wide range of assumptions. These are listed in the table below.

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<sup>16</sup> Review of potential cost savings to the water industry should phosphates be removed from DLCP. Atkins Dec 2008 for DEFRA.



**Table 1- Assumptions**

<b>Number</b>	<b>Assumption</b>	<b>Reference</b>	<b>Comment</b>
1	7.5% of phosphorus in raw sewage entering sewage works is from DLCP.	Working Group on phosphorus in detergents	Working group including water industry and detergents industry representatives reach consensus on this figure. 17 <sup>th</sup> Oct 2008
2	Percentage by weight of phosphorus in detergents containing significant phosphorus = 25-30%	UKCPI and CEEP	
3	Costs to Detergent industry	Information from UKCPI personal communications to working group Dec 2008	
4	Benefits to rivers based on Water Framework Directive Good Ecological Status. £22.45k/km/yr	Environment Agency	
5	Percentage households on dual sewerage systems with misconnections = 5%	From Environment Agency.	Data from water company surveys ranges from 2% to 7% of households misconnected 5% considered to be best estimate.
6	CSO spillage = 0.65% of sewage	From Environment Agency.	
7	Private sewerage 4% of total population England and Wales	Water UK	
8	Tonnes of phosphorus used per year in DLCPs = 3070 tonnes	Based on figures from the detergent industry.	

**7 Implementation issues****Geographic coverage**

66. This assessment covers England and Wales - in order to assist with future policy development in Wales, should it be necessary. Wales, Scotland and Northern Ireland administrations have indicated an interest in phosphorus in detergents regulation.

**Policy Review**

67. The policy will be reviewed in 2020 through:

- a) Monitoring by the Environment Agency. The routine monitoring of compliance with WFD objectives will show changes due to the ban on phosphorus use in detergent.
- b) Assessment of sales of detergents to establish sales of DLCP containing phosphorus have ceased.

**Commencement**

68. As noted above, it is assumed for option (3) that a ban to would be in place from 2015.

### **Enforcement**

69. Enforcement will depend on what option is identified. Consideration has been given to how the measures would be monitored and enforced. Under a regulatory scheme it is likely that existing enforcement authorities would take on responsibilities – for example Trading Standards. As such these proposals are considered to be consistent with the Hampton principles.

### **EU regulation**

70. There are no current EU regulations regarding the phosphorus content of detergents. This government intervention is aiming to deliver the most cost-effective and proportionate way of implementing the WFD and as such it does not go beyond the requirements of that Directive.

### **Compensatory simplification**

71. At this stage no options for compensatory simplification have been identified.

### **Carbon Impact Assessment**

72. These proposals are not considered to have a significant impact on the overall carbon emissions. The technology to strip phosphorus from wastewaters is energy intensive. The overall WFD identified the potential carbon implications of the phosphorus measures as being an additional cost of some £13 million per annum due to the emission of 360 thousand tonnes of CO<sub>2</sub> per annum. It should be stressed that these are for the whole programme of measures not the policy being considered in this IA.

73. Controls on phosphorus in DLCP would reduce the carbon impact as less energy would be expended in treating phosphorus in wastewaters. It has been argued that products based on phosphorus alternatives require higher temperatures to achieve the same wash performance. However, given the current wash performance of phosphorus and alternative phosphorus detergents this is not considered a significant issue. Since the impacts are not considered to be significant and are likely to be positive, an estimate of the carbon impacts is not provided. This is in line with BERR impact assessment guidelines<sup>17</sup>.

### **Competition**

74. We do not expect any competition issues to be raised by this proposal.

### **Impact on administrative burdens**

75. No significant impact on administrative burdens is expected.

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<sup>17</sup> <http://www.berr.gov.uk/files/file44544.pdf> Impact Assessment Guidance para 41

## Annex 1- Calculation of phosphorus loads.

### Estimates of UK phosphorus use in Domestic Detergents<sup>18</sup>

1. The detergent industry through UKCPI provided figures for the amount of phosphorus used in DLCPs and dishwasher detergents. The detergent industry was unable to supply supporting data for these figures due to commercial confidentiality issues.
2. However, based on a 36% UK ownership of automatic dishwashers and the fact that 96% use phosphorus-based detergents, a load of 3,219 tonnes-P/year was estimated using marketing and use data. This corresponds closely with the detergent industry value of between 3,600 and 4,000 tonnes/year for dishwashers. This correspondence for dishwasher figures provides some support to their estimates for phosphorus use in DLCP.
3. **So we have used the figure of 3070 tonnes per year as the best estimate for the load of phosphorus used in DLCPs in England and Wales.**

**Table A - Detergent industry estimates of UK phosphorus use in domestic detergents**

	UK Tonnes phosphorus/year		
	Automatic dishwashing	DLCP	Total Domestic phosphorus
Low estimate	3,600	3,360	6,960
High estimate	4,000	3,360	7,360
	England & Wales Tonnes phosphorus/year <sup>a</sup>		
Low estimate	3,290	3,070	6,360
High estimate	3,655	3,070	6,726

<sup>a</sup>Assuming a UK population of 58,000,000 and English & Welsh population of 53,000,000

Source of information UKCPI.

4. As a further check we have also calculated the phosphorus load from DLCPs using the figures below. The mid-range figure of 3742 Tonnes of P per year is reasonably close to the detergent industry estimate above; especially considering the range of values produced using detergent industry figures and UKWIR/SNIFFER report figures.

<b>Table B – alternative calculation of annual phosphorus load from DLCP</b>	Detergent Industry <sup>19</sup>	Mid-Point calculated	UKWIR/SNIFFER <sup>20</sup>
Phosphorus added to all detergents (UK) tonnes/yr	9500	9178	8856
Phosphorus added to all detergents (E&W) tonnes/yr	8681	8387	8093
DLCP used in UK per year (tonnes)	440000	441170	442340
% of products that contain STPP	10%	14%	17%

<sup>18</sup> Data and text from Review of potential costs savings to the water industry should phosphorus be removed from domestic laundry cleaning products Sean Comber Atkins for DEFRA 2008. 5073709/69/DG/016 which used data received from UKCPI representing the detergents industry.

<sup>19</sup> Information from UKCPI and CEEP

<sup>20</sup> Source control of P from domestic sources – options and impacts. UKWIR/SNIFFER/UKTAG Final Report, September, 2008

Average STPP content	25%	28%	30%
Tonnes of STPP in DLCP (UK)	11000	16378.44	22559.34
Tonnes of Phosphorus in DLCP (E&W)	10052	14967	20615
Tonnes of Phosphorus in DLCP (E&W)	2513	3742	5154

### Estimates of DLCP derived phosphorus in domestic discharges to sewer

- From the 3070 tonnes per year and using an English and Welsh population of 53,000,000 we estimated a per capita usage of DLCP of 0.16 g/person/day. The study carried out by UKWIR/SNIFFER/UKTAG (Sept 2008) produced information for sources of phosphorus to domestic foul sewers. We have assumed that 0.65% of sewage is lost to combined storm overflows from sewers<sup>21</sup> and 5% of sewage lost through 5% of domestic properties being misconnected<sup>22</sup>. We have used a figure of 96% for population connected to public sewer<sup>23</sup>. The results of calculations in relation to the contribution of DLCPs to phosphorus in sewage are shown in table C.
- This shows a DLCP contribution to sewer from the connected population as 7.8%. Taking into account losses to storm overflows and misconnections, we calculated that 7.5% (2,780 tonnes) of the phosphorus entering a sewage treatment works originates from DLCPs.
- Based on the available data, a contribution from DLCP to STWs of 7.5% phosphorus is likely to be the most accurate figure that can be derived, without a significant amount of additional research. This value (agreed by representatives of the Water Industry, Defra, EA, CEEP and Cleaning Products Industry – 17<sup>th</sup> October 2008) has been used to calculate the costs savings due to reduction of iron dosing.

**Table C - Estimates of DLCP domestic discharges to sewer**

	<i>Per capita discharge (g/capita/day)</i>	Tonnes-P/year				% to WwT W
		P to sewer from connected population	Lost to domestic misconnections	Lost to CSO	Total to WwT W	
Urine	0.90	16,714 (43%)	836	108.6	15,770	42.7%
Faeces	0.50	9,286 (24%)	464	60.4	8,761	23.7%
Auto dishwashing	0.19	3,529 (9.0%)	176	22.9	3,330	9.0%
<b>Laundry</b>	<b>0.16</b>	<b><sup>24</sup>2,947 (7.6%)</b>	<b>147</b>	<b>19.2</b>	<b>2,780</b>	<b>7.5%</b>
Mains supply	0.12	2,229 (5.7%)	111	14.5	2,103	5.7%
Food waste	0.10	1,857 (4.8%)	93	12.1	1,752	4.7%
Town centre*	0.03	1,281 (3.3%)	64.1	8.3	1,209	3.3%
Toothpaste	0.07	501 (1.3%)	25.1	3.3	473	1.3%
Consented industry*	0.02	464 (1.2%)	0.0	3.0	461	1.2%
Runoff*	0.007	132 (0.3%)	0.0	0.9	131	0.4%

<sup>21</sup> Based on advice from the Environment Agency 2008

<sup>22</sup> Based on survey information from water companies that the Environment Agency has collated (personal communication 2008).

<sup>23</sup> Information from Water UK [UK http://www.water.org.uk/home/news/press-releases/water-infr-170604-1?s1=inheritance](http://www.water.org.uk/home/news/press-releases/water-infr-170604-1?s1=inheritance)

<sup>24</sup> 96% of 3070 tonnes since only 96% of population connected.

Light industry*	0.004	68 (0.2%)	3.4	0.4	64	0.2%
<b>Total</b>	<b>2.11</b>	<b>39,008</b>	<b>1,921</b>	<b>254</b>	<b>36,834</b>	<b>100</b>

\*UKWIR, SNIFFER UKTAG phosphorus report 2008

Table based on detergent industry estimate of phosphorus in DLCP.

### Load of phosphorus to the Environment derived from DLCP

8. The amount of phosphorus entering the aquatic environment was calculated from figures quoted by White and Hammond (2006)<sup>25</sup>. They estimated that the total phosphorus load contained in the waters of England Scotland and Wales was 41,600 tonnes per year. The total Soluble Reactive Phosphorus (SRP) load to the waters of England Scotland and Wales was estimated to be 31,300 tonnes per year.
9. Assuming the population of England and Wales is 53 million and the population of Scotland is 5.1 million<sup>26</sup>. The total phosphorus load to England and Wales would be 38,000 tonnes per year and the SRP would be 28,600 tonnes per year. Table D shows where the phosphorus in sewage flows to. The information was produced by the Environment Agency based on water company returns and asset management plans. Table D also shows how much phosphorus treatment we expect to be installed at sewage treatment works by 2015. The table takes into account the fact that the WFD allows us to set alternative objectives if achieving objectives is not feasible, or disproportionately costly within the timeframe allowed. If alternative objectives are set, some schemes for phosphorus removal may be delayed (See table D).
10. The fate of phosphorus from DLCPs depends on whether wastewaters come from domestic or trade premises. 4% of domestic premises have private sewerage facilities such as septic tanks. 96% of the population is connected to a centralised sewerage collection and treatment system. However, we estimate that 1.3% of houses are misconnected - based on analysis by the Environment Agency using water company data<sup>27</sup>. A misconnection occurs when foul waste is incorrectly connected to a surface water drainage system - usually as the result of incompetent DIY or plumbing. Also a small amount of wastewater from connected properties never reaches the sewage treatment works because of overflow systems which divert the flow from combined drainage systems during heavy rainfall events. There is uncertainty over the exact amount arising from these combined sewers overflows (CSOs). However, advice from the EA suggests 0.65% is a suitable estimate for the purposes of this assessment.
11. Of the total load of wastewater entering water bodies in England and Wales - measured as 65 million population equivalent load (PE) - 37 million PE is destined for freshwaters. Figures provided by the Environment Agency (EA).
12. According to figures provided by the EA, of the 37 million PE of load going to freshwaters, 26.6 million will have treatment to remove phosphorus by 2027.

<sup>25</sup> Updating the estimate of the sources of phosphorus in UK waters. A Defra funded project WT0701CSF

Philip J. White and John P. Hammond 2006

<sup>26</sup> Taken from official statistics for Scotland.

<sup>27</sup> Information from Environment Agency December 2008

**Table D - Distribution of sewage by population equivalent**

<b>Population (millions)</b> <sup>28</sup>	
UK	58
England and Wales	53
<b>Destination of sewage</b>	
Connected population <sup>29</sup>	96%
Private sewerage <sup>30</sup>	4%
Not reaching STW CSOs <sup>31</sup>	0.65%
Misconnected <sup>32</sup>	1.3%
Percentage sewage reaching Sewage Treatment Works (STW)	94.1%
Total	100%
<b>Sewage To Freshwater</b>	
Total E&W *PE load <sup>33</sup> (millions)	65
% total sewage in freshwaters	57%
Total E&W PE load to freshwaters <sup>34</sup> (millions)	37
<b>Predicted Phosphorus Removal at Sewage Works</b>	
Expected P reduction *PE of STW with phosphorus removal by 2010 <sup>35</sup>	16.7
Additional UWWTD** designations *PE (millions) <sup>36</sup>	5.5
Expected P reduction *PE coverage by 2014 (sum of previous two lines)	22.2
Additional *PE (millions) of STW with P reduction for WFD <sup>37</sup>	1.5
<b>Total PE with P reduction post WFD (millions)</b>	<b>23.7</b>
<b>% Population served with P reduction in STW</b>	
2010 Percentage with P removal	26%
2014 Percentage with P removal	34%
2015 with WFD alternative objectives percentage with P removal	34%
2015 with WFD no alternative objectives Percentage with P removal	36%

\*PE = Population Equivalent. 1 PE = an organic load of 60 g per head per day.

\*\* UWWTD = Urban waste water treatment directive

13. Using the information in Table D, we can calculate the loads of phosphorus going to the environment through various routes. To do this, we have made assumptions on the proportion of phosphorus removed through the different processes occurring in sewage flows. Table E shows the assumptions used for treatment.

<sup>28</sup> Figures for mid 2007 – Office of National Statistics and Welsh Assembly Government Statistic web sites.

<sup>29</sup> Figures from Water UK web site. 52 million in England and Wales connected to sewerage

<sup>30</sup> Assume the rest of the population has private sewerage treatment

<sup>31</sup> There is uncertainty over the exact amount arising from these combined sewer overflows (CSOs) but, given advice from the EA, it is taken as around 0.65% for the purposes of this assessment.

<sup>32</sup> Communication from Environment Agency based on data from water company surveys with ranges from 2% to 7% of households misconnected. 5% considered to be best estimate.

<sup>33</sup> Calculated based on Water Companies discharges BOD load information - EA Calculation in 2006 for Strategic Assessment. Estimated as 63 million p.e. in companies reporting to Ofwat in June Return 2007.

<sup>34</sup> Environment Agency calculation using (19) and information on discharge point of sewage works.

<sup>35</sup> EA Calculation for 2006 Strategic Assessment gave 16.7 million p.e. By 31st March 2008 the companies reported that P removal installed at STWs serving about 13 million p.e.

<sup>36</sup> This relates to water company asset management plans for 2010 to 2015 - the population equivalent under the UWWTD drivers for riverine discharges in PR09 with P removal is about 5.5 million p.e

<sup>37</sup> Possible additional phosphorus removal schemes which do not yet have sufficient proof to merit confirmation of phosphorus removal

**Table E - Assumptions on Phosphorus removal**

<b>P remaining after any treatment</b>	<b>H</b>	<b>M</b>	<b>L</b>
CSO spills	100%	100%	100%
Private sewage	52%	39%	25%
STW without P removal	52%	52%	52%
STW with P removal	20%	20%	20%
Misconnections	100%	100%	100%

Information provided by the Environment Agency.

#### **Amount of DLCP Derived Phosphorus Going to Freshwater Environment**

14. In Table F we have calculated that phosphorus which derives from DLCP going to the environment = 1316 tonnes per year. This is 3% of the total phosphorus and 4% of the soluble reactive phosphorus load going to the waters of England and Wales.

**Table F – calculations of phosphorus load to the environment  
Discharges to the Environment**

	To Estuarine and Coastal Waters *	To Freshwaters where STW have no P removal (current, planned or possible)	To Freshwaters where STW currently have P removal	To Freshwaters where STW will have P removal in future (regardless of WFD)	To Freshwaters where STW may have P removal under WFD by 2015 (phased)
% PE	43%	20%	26%	8%	3%
PE millions	28	13	17	6	1.75
Before treatment P load tonnes/yr	1246	581	743	245	78
Figures below are DLCP derived phosphorus After Treatment					
P from STW	648	302	149	49	40
P from CSO	9	4	5	2	1
P from Misconnections	17	8	10	3	1
P from septic tanks	20	10	12	4	1
<b>Total P to England and Wales waters</b>	<b>715</b>	<b>324</b>	<b>176</b>	<b>58</b>	<b>43</b>
<b>Total P that could be prevented with ban</b>	<b>694</b>	<b>324</b>	<b>28</b>	<b>9</b>	<b>43</b>

Comment	Discharges to coastal and estuarial waters	Typically in less sensitive areas	Typically in Eutrophication Sensitive Areas	As a result of further UWWTD designations	Assuming use of alternative objectives for a proportionate and adaptive approach
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\*Assume no phosphorus removal plant

PE = population equivalents – the number of people and industry in people equivalent units served by a sewage works

P = phosphorus



## Annex 2 - Water Framework Directive Considerations

### WFD Benefits Analysis

1. Considerable value is placed on a high quality water environment. The overall WFD IA concluded benefits could be in the range of £0.65 to £1.7 billion per annum<sup>38</sup> depending on how quickly progress is made towards a good ecological status. This was based on the National Water Environment Benefits survey completed during the summer, 2007 - involving 1500 stated preference interviews with the general public<sup>39</sup>. Figures are being updated, based on the analysis of classification data and indications are that the benefits will be lower, but still very significant. This impact assessment uses mid-range values for benefits of achieving good status developed for the WFD.
2. This represents a situation where there is an improvement of water bodies from around 15% at high quality (in the absence of the WFD) to around 95% at high quality<sup>40</sup> following implementation of the Directive. Of the 80% of water bodies that would be improved in these scenarios, a proportion of them suffer from the effects of non-agricultural diffuse pollution and discharges of phosphorus from point sources. Around 50% of river water bodies fail to meet water framework directive phosphorus objectives so control of phosphorus plays a vital role in meeting the WFD.

### Preliminary Cost Effective Analysis for Water Framework Directive

3. Evidence on costs and cost-effectiveness in the overall WFD IA is based on the preliminary cost-effectiveness analysis (pCEA). This analysis, led by Defra with the help of the Environment Agency, industries and other organisations<sup>41</sup> identified measures for two broad national level scenarios:
  - 1) Sector-based working groups looked at measures that could be taken to reduce the risk of not meeting WFD standards. Sector working groups included Agriculture, the Water Industry, and Industry. Non-Agricultural Diffuse Pollution was treated as a separate sector for the purpose of this analysis. The sector working groups produced a series of reports detailing the costs of specific, technically feasible measures that could be taken to help meet the WFD requirements.
  - 2) The sector-based outputs were aligned a pressure by pressure basis to produce a synthesis report. The synthesis reports considered the cost-effectiveness of individual measures undertaken by sectors and identified broad scenarios which could be undertaken to meet the WFD requirements over different time periods (roughly a “phased/adaptive” scenario and a “do everything as soon as possible” scenario).
4. In the case of phosphorus, the synthesis report considered evidence from the sector working groups based on the following measures:
  - End of pipe treatment by the water industry to chemically or biologically strip phosphorus from wastewaters received from households,
  - The agricultural industry move towards catchment sensitive farming (CSF) that involves a combination of voluntary and regulatory action.

<sup>38</sup> Equivalent Annual Value basis, 2007 prices.

<sup>39</sup> See <http://www.wfdcrp.co.uk/> for a copy of this report and appendices

<sup>40</sup> High quality is a description used in the NWEB survey. It is broadly equivalent to good and above good ecological status.

<sup>41</sup> The detergents industry was not specifically involved, although wider industrial interests were.

- Direct industrial dischargers upgrade effluent treatment plants.
  - A range of sectors act to tackle non-agricultural diffuse pollution including misconnections and removing phosphorus at source through the reduction/elimination of phosphorus in domestic laundry cleaning products.
5. Although not considered by the sector groups, the nutrients group also considered the use of phosphorus to reduce the lead content of water in areas where lead is present in water pipes as an additional issue. They also helped to initiate more long- term research on the role of diet as a source of phosphorus in wastewater.
  6. The pCEA concluded that action on all sources is likely to be necessary to achieve standards proposed for good ecological status. Even if all actions are implemented it will be very difficult to achieve the phosphorus standards and widespread use of exemptions is likely to be needed. Exemptions allow a longer period to meet the standards, or less stringent objectives are set as an alternative. The exact nature of control measures is subject to river basin specific analysis as part of the River Basin Planning process.
  7. The pCEA only considered two options for DLCP – a full and a partial ban. This preliminary analysis, though highly uncertain, identified control on phosphorus in DLCP as potentially the most cost-effective measure that could be taken. The consultation on the second tranche of guidance to the Environment Agency on River Basin Planning identifies control on phosphorus in DLCP as a likely national measure. The EA has produced plans which take this into account.
  8. This impact assessment is the next step in the process as it considers the control of phosphorus in more detail – extending the analysis beyond the two simplistic scenarios identified in the pCEA. This impact assessment benefits from extensive discussions with representatives from the cleaning products industry sector, which has helped to refine the analysis undertaken in the pCEA. The following table summarises the costs of the programme of measures identified in the WFD overall IA.

## Annex 3 - Cost Benefit Calculations<sup>42</sup>

### Costs

1. Costs calculations were based on information from UKCPI.
  - The capital cost range was estimated to be £10-15 million.
  - The on-going costs were estimated at £5-8 million per annum.
  
2. A discount rate of 3.5% was used and a discounting period of 15 years was used to show effects from 2012 when detergent industries would start reducing phosphate until the end of the Water Framework Directive cycle in 2027.
  
3. The Net Present Value (NPV) for the least cost was calculated as £67.59 million. The NPV for greatest cost was calculated as £107.14 million. **The mid-cost NPV cost, after rounding, was £87 million.**

### Benefits

4. The benefits were calculated for:
  - a) The saving to the water industry
  - b) The benefit to the environment in meeting WFD objectives
  
5. The saving to the water industry<sup>43</sup> was calculated to be:
  - A Capital saving of £2.96 million since less capital would be spent on building phosphorus removal plant.
  - Ongoing annual saving of £2.36 million
  
6. The benefits to river quality were calculated to be 190 km of river reaching good status from poor status. The value of this was between £13.3k and £42.6k

**Table G Benefits for River Quality Improvement**

		Low	Mid Range	High
<b>WFD benefits £ per km</b>		£13,300	£22,450	£42,600
Assume 190 km	190	£2,527,000	£4,265,500	£8,094,000

7. We added the savings to water companies to the ranges of river benefit values (see table H).

**Table H - Ranges of benefits in £ millions**

ESTIMATE	Low	Mid Range	High
Water Company capital savings	2.96	2.96	2.96
Water Companies operating savings	2.36	2.36	2.36
Water company operating savings plus river benefit	4.89	6.63	10.45

8. A discount rate of 3.5% was used and a discounting period of 15 years was used to show effects until the end of the Water Framework Directive cycle in 2027.

<sup>42</sup> 0906216 Costs and Benefits P spreadsheet.xls

<sup>43</sup> From Review of potential costs savings to the water industry should phosphorus be removed from domestic laundry cleaning products Sean Comber Atkins for DEFRA 2008. 5073709/69/DG/016 which used data received from UKCPI representing the detergents industry.

9. The maximum NPV benefit was calculated as £123.36 million. The minimum NPV benefit was calculated as £59.25 million. **The mid-range NPV was therefore £91 million.**
10. The best estimate NPV  $£91 - £87 =$  **£4 million**
11. This is a small net benefit and because of the uncertainties involved, show that on monetised benefits that this proposal is close to cost neutral.