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Prioritising chemicals for standard derivation under Annex VIII of the Water Framework Directive

Science Report –SC040038/SR

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This report is the result of research commissioned and funded by the Environment Agency's Science Programme.

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Steve Killeen

Head of Science

Executive summary

Annex VIII of the Water Framework Directive (WFD) requires Member States to identify 'Specific Pollutants', ie those discharged to water in 'significant quantities', and derive Environmental Quality Standards (EQSs) for these chemicals in order to help achieve the objective of Good Surface Water Status.

A collaborative project between the Environment Agency and the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) was commissioned in 2004 to develop a robust and transparent methodology for identifying and prioritising Annex VIII chemicals in the UK, and to develop standards for the first tranche of Specific Pollutants. This report outlines the work that has been undertaken to meet the former objective. It details the development of a list of chemicals of concern and a prioritisation methodology, and summarises the results of the subsequent prioritisation exercise.

It was agreed by the UK Technical Advisory Group (TAG) Chemistry Team that the approach used to identify and prioritise chemicals should be consistent with the guidance produced by the EU IMPRESS (IMPacts and PRESSures) working group, which was set up to identify pressures and assess impacts on water bodies in relation to the WFD. The guidance outlined a generic approach that could be used to select a list of Specific Pollutants.

In line with the IMPRESS guidance, candidate chemicals were identified from a range of existing drivers. These included existing monitoring and legislative requirements, eg the National Marine Monitoring Programme and the Dangerous Substance Directive (76/464/EEC) as well as national initiatives such as the UK pesticide usage surveys. The initial list was reviewed to remove duplicates, those chemicals already being considered by the EU under Annex X of the WFD and substances for which the prioritisation process is not appropriate, such as metals and other inorganic substances. This process resulted in a list of approximately 300 candidate chemicals which was termed the 'Universe of Chemicals'.

The Environment Agency's Chemicals Screening and Prioritisation method was chosen as the basis of the prioritisation approach, as it met the requirements of the IMPRESS guidance and was a method with which we already had some experience. The screening tool was developed to consider impacts on terrestrial and aquatic life as well as human health considerations. As the WFD standards only need to consider the protection of aquatic life, the tool was modified for this exercise, to only consider hazards related to the aquatic environment (water column, sediment and secondary poisoning).

The prioritisation process ranks substances based on their potential exposure in the aquatic environment and hazard to aquatic life. Exposure is assessed according to available monitoring and use (tonnage and use scenario) data and hazard is assessed based on persistence, bioaccumulation and toxicity. A score is then assigned for both exposure and hazard based on the available data. These scores are combined to give an overall priority ranking of 1 to 5 with 1 indicating highest priority and 5 the lowest. There are minimum data requirements for an assessment to be made and if these are not met the substance will be assigned a final ranking of 'Insufficient Information'.

The prioritisation approach also incorporates a review of the priority rankings. This does not involve detailed discussion of the data used to determine the priority ranking, but:

• enables a check on the score assigned and flags any anomalies

- provides an opportunity for highlighting further data sources
- enables discussion about how particular substances should be dealt with, for example should they be taken forward for EQS development, should additional data be obtained, are other controls in place which reduce the need for an EQS

Due to time constraints not all substances could be reviewed and therefore we focused attention on those substances assigned a priority ranking of either 1 or 2.

The review exercise concluded that not all the substances identified as high priority (ranked 1 or 2) should be put forward for consideration for EQS development at this stage. This was for a number of reasons including a need for further information (such as additional data on use), existing controls (such as restrictions on use which may influence the need for an EQS) and on-going reviews (such as reviews under the Plant Protection Products Direcive the outcomes of which may affect the need for an EQS). The latter, for example, may result in a pesticide not being approved for use in the EU.

At this stage a total of 32 substances have been identified for EQS development as a result of the prioritisation exercise undertaken on the 'Universe of Chemicals' (including the List 2 chemicals) and the review of discharge permits. EQSs are currently being derived for 30 of these chemicals. A number of other substances were identified as of high priority based on the prioritisation process but were not put forward for EQS development at this stage due to a need for further information. They will need to be reconsidered as additional data become available. In addition, due to time constraints, the review process focused on those substances that were ranked as Priority 1 or 2. The other substances need to be reviewed before any decisions are made on these chemicals.

The exercise has highlighted a number of issues that need consideration when using the prioritisation process. These include limited availability of usage data and the need to consider data on persistence and bioaccumulation more broadly. Many of these issues have been addressed at the review stage and this supports the need for inclusion of this within the overall prioritisation process. However others will need to be addressed before further prioritisation exercises. This includes use and interpretation of fugacity modelling. This was included as a tool to help assess potential exposure in the aquatic environment but due to data limitations it provided limited benefit during this particular exercise. The use of this approach in future exercises needs to be considered.

Contents

1   Introduction

In December 2000, the Water Framework Directive (WFD) (2000/60/EEC) came into force.   Its objectives include to protect, enhance and restore all bodies of surface and groundwater with the aim of achieving good surface water status and good groundwater status by 2015.

Chemical quality is one of the parameters that will be used to determine good surface water status and the Directive proposes setting environmental quality standards (EQSs) for chemicals in order to help achieve this.

Standards for the most polluting substances, known as Priority Substances or Priority Hazardous Substances are derived at an EU level and will be listed in Annexes IX and X of the WFD. Compliance with these standards will provide one element in achieving Good Surface Water Status. To date, 33 such substances have been identified and the EU is in the process of finalising standards for these chemicals.

In addition, Annex VIII of the WFD requires Member States to identify and derive EQSs for other pollutants that are discharged to water in 'significant quantities'. These are called Annex VIII substances or, more commonly, Specific Pollutants.   Again, compliance with these standards is required for a waterbody to attain Good Surface Water Status.

A collaborative project between the Environment Agency and the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) ('Water Framework Directive Annex VIII Environmental Quality Standards Development' (Project Ref: SC040038)) was commissioned in 2004 to develop a robust and transparent methodology for identifying and prioritising Annex VIII chemicals relevant to the UK and to develop standards for the first tranche of Specific Pollutants This report outlines the work that has been undertaken to meet the former objective. It details the development of a list of chemicals of concern and a prioritisation methodology and summarises the results of the subsequent prioritisation exercise.

2 Identification of priorities for EQS development

Before we can select candidates for EQS derivation under Annex VIII of the WFD we first need to:-

- identify candidate chemicals of concern
- rank these chemicals using a prioritisation process

An initial paper outlining potential options for undertaking the above was drawn up for the UK Technical Advisory Group (TAG) Chemistry Team in March 2004. It investigated existing approaches and proposed various options for identifying and prioritising chemicals (Roberts and Miller 2004). This prompted a series of discussions within UK TAG, leading to the conclusion that the approach used should be consistent with the guidance produced by the EU IMPRESS (IMPacts and PRESSures) working group (European Commission 2003). This working group was set up as part of the EU's strategy for supporting the implementation of the WFD, to identify pressures and assess impacts in relation to the characterisation of water bodies. The group concluded that the selection of Specific Pollutants was a key question in the analysis of pressures and impacts. The IMPRESS guidance outlines a generic approach that can be used to select a list of Specific Pollutants for water bodies within a river basin (European Commission 2003). This generic approach is outlined in Appendix 1.

Based on this generic guidance, we developed the following approach for the identification and prioritisation of chemicals in relation to the WFD, which was submitted to UKTAG on the 15th September (UK TAG 2005).

2.1 Identification of candidates for prioritisation

In accordance with the IMPRESS guidance, a range of drivers including existing monitoring, legislation and other international obligations were used to produce an initial list of substances. The drivers used are shown in Figure 2.1 with further detail on each being provided in Appendix 2. This approach results in an inclusive list that incorporates chemicals for which there are international and national obligations (such as the Dangerous Substance Directive (76/464/EEC)), as well as those that have been identified through national initiatives (such as surveys of UK pesticide use and Environment Agency reviews of pharmaceuticals and veterinary medicines).

This initial list of substances was then reviewed to form the list of chemicals of concern (also known as the 'Universe of Chemicals'). This involved removing:

- duplicates;
- chemicals already considered by the EU under Annex X of the WFD;
- chemicals already considered in the first batch of 15 Annex VIII chemicals (See Section 2.2.5);
- substances for which the prioritisation process is not appropriate, eg metals, other inorganic substances;
- groups of substances, eg phenols, hydrocarbons, surfactants for which it is not easy to make an assessment due to the large number of differing chemicals within these groups ;

- parameters not deemed to be relevant for this exercise, eg dissolved oxygen (DO) , Biological Oxygen Demand (BOD), suspended solids.

A key driver was the list of substances classified as List 1 or 2 under the Groundwater Directive. However, not all the substances on this extensive list were included on the 'Universe of Chemicals'. This was because many of the substances on the list had been included due to specific local issues, and did not reflect a national concern. Therefore, for the purposes of this exercise, only those substances that also appeared on other drivers were included. This resulted in approximately 200 substances being excluded for this particular exercise.

The resulting 'Universe of Chemicals' comprised of approximately 300 chemicals.

EXISITING MONITORING OBLIGATIONS

♦ The Shellfish Water Directive
♦ The Freshwater Fish Directive
♦ The Bathing Water Directive
♦ National Marine Monitoring Programme
♦ Environmental Change Network

EXISTING OBLIGATIONS

♦ The Dangerous Substances Directive EQSs
♦ Protection of the North Sea – Red List and Hazardous Substances List
♦ OSPAR priority list
♦ OSPAR veterinary medicinal products used in aquaculture
♦ EPER
♦ The Stockholm Convention on Persistent Organic Pollutants (POPs)/United Nations Environmental Programme

Initial UK 'Universe of Chemicals'

REGIONAL PRIORITIES

♦ Identified from characterisation processes/screening

OTHER DATA SOURCES

♦ COMMPS
♦ Pesticides of possible relevance (data from CSL)
♦ Existing Substances Regulation (ESR) substance of potential risk in UK
♦ UK Chemicals Stakeholder Forum
♦ The Groundwater Directive
♦ Human Pharmaceuticals
♦ Endocrine disrupting substances
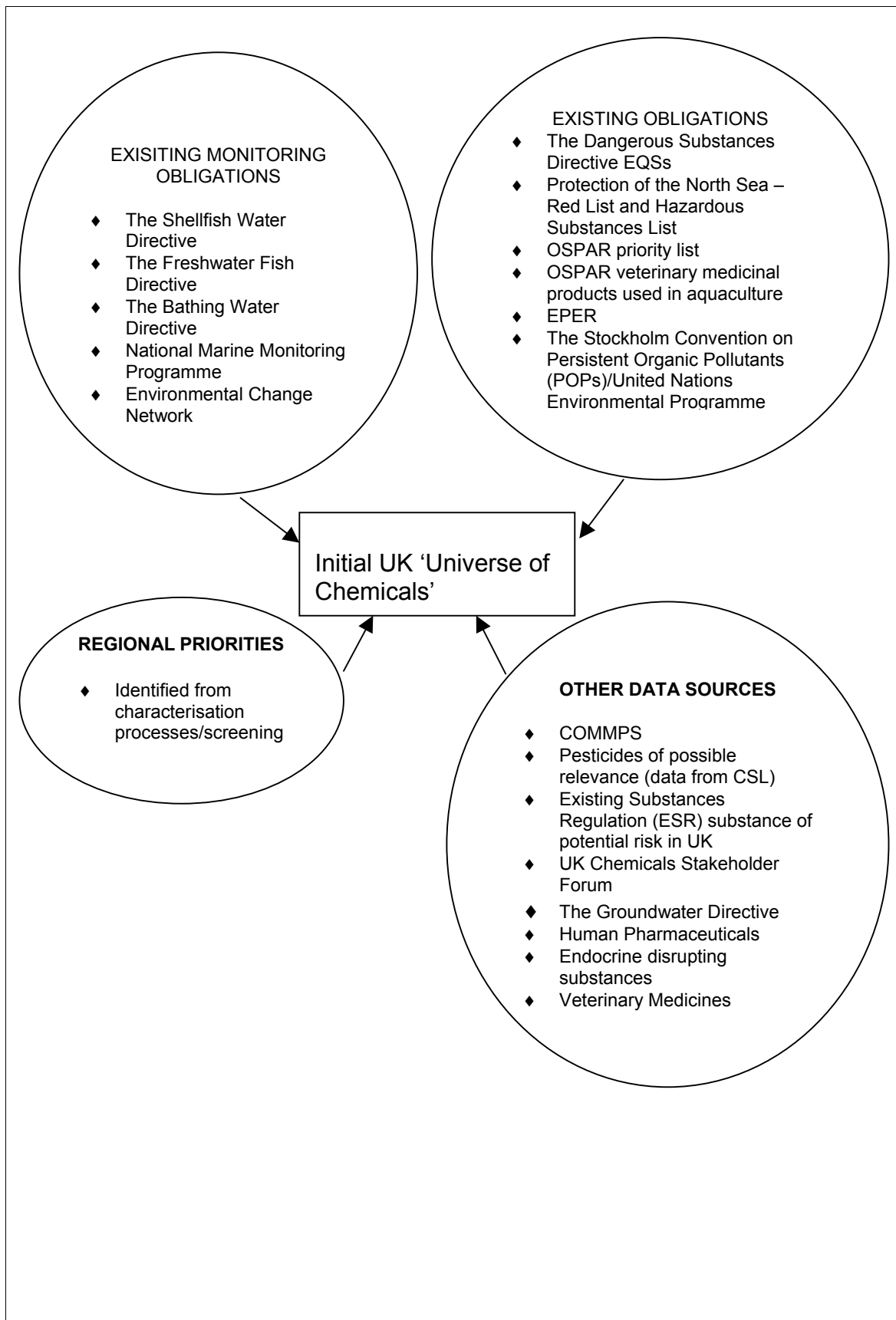♦ Veterinary Medicines

Figure 2.1   Drivers used to compile a UK 'Universe of Chemicals'

2.2   Prioritisation

The approach developed to prioritise the chemicals included in the 'Universe of Chemicals' is outlined in Figure 2.2 and detailed below. The approach involves prioritisation along with modelling and a review process to consider the rankings arising from the prioritisation and discuss the way forward for the particular chemical. Further detail on the approach is given in Appendix 3.

2.2.1   Prioritisation method

The Environment Agency's Chemicals Screening and Prioritisation method was chosen as the basis of the WFD prioritisation approach as it met the requirements of the IMPRESS guidance and was a method with which we already had experience.   The approach was developed in 2003, as part of the Environment Agency's Chemicals Strategy, as a screening tool to help identify chemicals which may pose a risk to the environment of England and Wales and which may need further investigation.

The approach involves an assessment of:

- the potential environmental exposure of a chemical;

- its hazardous properties.

A score is assigned for both exposure and hazard according to available data and the two scores are then combined to give an overall priority ranking. Substances posing high hazard to the environment but which are not detected, or are unlikely to enter the aquatic environment, will have a lower priority, for example, compared with substances of high hazard but with significant potential to enter the environment. If the minimum data requirements are not met this results in the substance being assigned a ranking of 'Insufficient information'.   As we see later this applied to a large proportion of chemicals in the 'Universe of Chemicals'.

There are five priority rankings with 1 indicating highest priority and 5 the lowest. Those substances with the highest rankings, ie 1 or 2 will be considered first for EQS development.

The prioritisation approach is useful in providing an indication of the relative priorities of a large number of chemicals based on a consideration of their potential environmental risk. It does not, however, constitute a full risk assessment for individual chemicals.

The process used to assess exposure and hazard is summarised below.
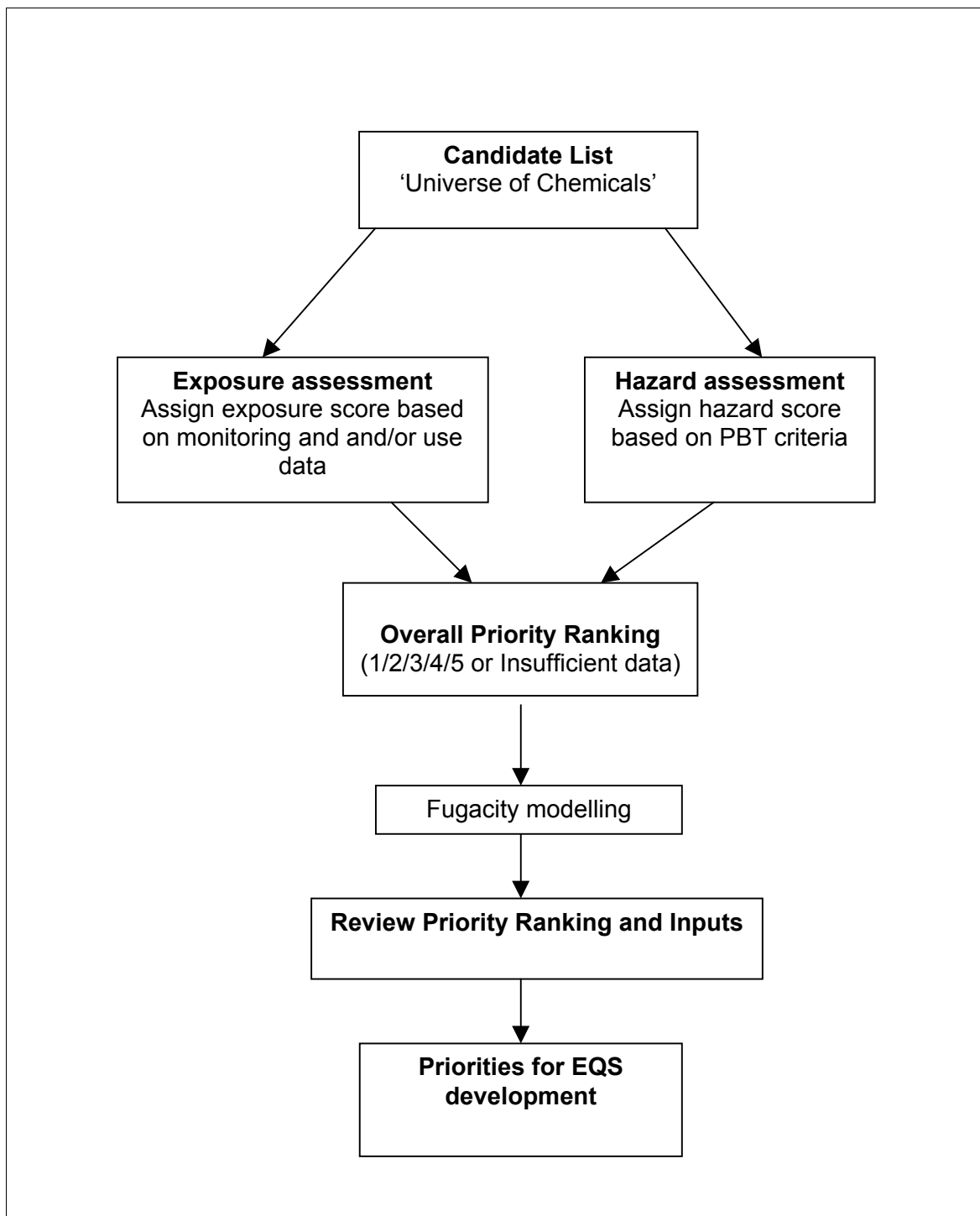
Figure 2.2 Outline of prioritisation methodology

Exposure

Exposure is based on a combination of monitoring and usage data where available. Ideally exposure would be determined on the basis of monitoring data indicating presence/absence in the environment. However monitoring data are limited or non-existant for many chemicals and therefore a combined approach, in which usage data are also collated to give an indication of potential environmental exposure, has been used. Scores are assigned for both monitoring and usage data, with the highest score

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being taken as the overall exposure score. If neither monitoring nor use data are available an exposure score cannot be assigned, resulting in an overall priority ranking of 'Insufficient Information'.

- Monitoring data - the score is determined by the number of Regions in which the chemical was detected in surface and ground water above the reporting threshold (0.1ug/l for surface water and any positive detection for groundwater), and whether the concentrations detected exceed the available EQS (or an equivalent, eg Predicted No Effect Concentration (PNEC) derived under the Existing Substances Regulations (ESR)). Higher scores are given where a substance is found widely and at concentrations above EQS values.
- Use data – the score is based on a consideration of both tonnage used and use scenarios, such as whether the chemical is likely to be released directly into the environment (e.g. agricultural pesticides) or its use is largely confined to closed industrial systems. A score is given for each of these aspects and these are combined to give an overall exposure score based on use.

Hazard assessment

The screening tool was developed to incorporate a range of hazard data including impacts on terrestrial and aquatic life, and also human health considerations. The standards to be developed under the WFD need only consider the protection of aquatic life. Therefore for the purposes of this exercise the screening tool was modified so that it only considered hazards in relation to the aquatic environment (water column, sediment and secondary poisoning). The hazard data considered included:

- Persistence – half lives in water and sediment and ready biodegradability

- Bioaccumulation – log Kow and Bioconcentration Factor (BCF) values in aquatic biota

- Toxicity – acute and chronic toxicity to aquatic organisms and endocrine disrupting potential

A hazard classification is assigned for each of these properties by comparing the available data with agreed criteria. For persistence a substance may be classified as persistent (P), highly persistent (HP) or very persistent (vP). The hazard classifications are combined to give an overall hazard score for a substance. Substances which have a high hazard classification (ie are very persistent (vP), very bioaccumulative (vB) and very toxic (vT)) will have a high hazard score, ie 4, whereas those that are not found to be toxic, bioaccumulative or persistent will have a score of 0.

A hazard score can only be assigned if data are available for all three criteria. If data are not available for one or more of these criteria then a hazard score cannot be assigned and the overall priority ranking will be 'Insufficient information'.

Consideration of each of the criteria may require a range of endpoints to be considered. Persistence, for example, requires ready biodegradability and half life in water and sediment to be taken into account, however this could potentially result in a range of hazard classifications. For example ready biodegradability may indicate vP but water half life data may indicate P. The guidance indicates that the worst case classification should be used, so for this example the substance would be classified vP because of the ready biodegradability. In some situations, however, further consideration of the data may be required when assigning a hazard classification. For example, assessment of bioaccumulation is based on consideration of both Log Kow and BCF values. For certain chemicals the log Kow may indicate vB but the BCF value

may indicate not bioaccumulative. Using the worst case scenario, the chemical would be classified vB, however further consideration of the data shows that although the log Kow value indicates bioaccumulation based on prediction from physical chemical properties, bioaccumulation does not occur due to the molecular size of the chemical . Therefore the BCF value is lower but is the most relevant value to use.

The assessment of hazard places emphasis on laboratory data and so, to promote consistency, the detailed guidance on the prioritisation methodology specifies the types of studies that may be used (See Appendix 3).

2.2.1   Data gathering

A wide range of data is required in order to be able to carry out the prioritisation. The approach for gathering the data and the sources of information used is described below.

Exposure information

Monitoring data

Monitoring data for the period 2000-2006 (Feb) were obtained from the Environment Agency's National Data Unit. Monitoring data from Scotland and Northern Ireland was also available for some chemicals. Results from routine monitoring of surface (both fresh and saltwater) and groundwaters, effluent monitoring, special investigations and pollution incidents were provided for each of the chemicals of interest.   However, only data for routine environmental samples were used in the assessment of exposure to avoid bias resulting from, for example, focused investigations or pollution incidents.

In addition, the results of a targeted monitoring exercise undertaken as part of an Environment Agency research project on pharmaceuticals were used to gain information on levels of certain pharmaceuticals in the environment (Environment Agency 2003).

Use data

A range of sources was used to collate data on use patterns and tonnages. Where possible, data was obtained from peer-reviewed documents or reliable sources. These included:

- Central Science Laboratory (CSL) pesticide usage statistics;

- Pesticide Safety Directorate database of approved pesticides;

- Health and Safety Executive database of approved products;

- Review documents such as ESR risk assessemnts and reviews undertaken by the Organisation for Economic Co-operation and Development (OECD), eg Substance Information Datasheets (SIDS);

- Environment Agency reviews on veterinary medicines and human pharmaceuticals.

The scope of these data sources needs to be recognised when using the data. For example, the CSL data on pesticide usage relates to use on crops and would not therefore include data on use on hard standings. Therefore if a key use of a pesticide was to control vegetation on hard standings (eg amitrol) the tonnage data provided might underestimate the overall tonnage used.

Ideally, data relating to uses and tonnages in the UK are used. Although some of the data sources provide UK-specific data, much of the data refers to European or worldwide usage, particularly for industrial chemicals. In these cases extrapolations have to be made for UK use. Where European data were available, for example, the prioritisation guidance suggested a standard proportion of 20% should be assumed to have been used in the UK. No guidance was available for estimating from worldwide figures but a value of 10% was generally used. Many of the data are old and may relate to production rather than use. Although such data can be used within the prioritisation approach the issue would need to be highlighted at the review stage (See Section 2.2.4) so that a decision can be made as to whether further data is required before a substance can be taken forward for EQS development.

Hazard data

Where available, international review documents were used as the source of hazard data as they have often been peer-reviewed. These included:

- EU Plant Protection Product Directive (PPPD) assessments;

- Risk assessments undertaken under the Existing Subtances Regulations;

- OECD Screening Information Datasheets (SIDS);

- WHO Environmental Health Criteria (EHC) reports.

Where such reports were not available, readily available data sources were used. Key databases were the United States Environmental Protection Agency (USEPA) Ecotox database and the Hazardous Substances Database (HSDB). Endocrine disrupting potential was determined from the review by the Institute for Environment and Human Health (2005) and the work that has been undertaken by the EU to identify substances of concern in relation to endocrine disrupters (http://ec.europa.eu/environment/endocrine/strategy/substances_en.htm).

2.2.2   Fugacity modelling

Fugacity modelling is included in the overall prioritisation process. This predicts the distribution of a chemical in the environment and can therefore be used to help identify the environmental medium in which a chemical is most likely to be found. Fugacity modelling has therefore been incorporated in the prioritisation process to help assess the potential environmental exposure, as it will help indicate whether a chemical is likely to distribute to the aquatic environment.

Version 3 of the Trent University (Canada) Fugacity-Based Environmental Equilibrium Partitioning Model 2004 was used with the Level 1 simulation applied. This is the simplest level of modelling and models the equilibrium distribution of a fixed quantity of chemical in a closed environment at equilibrium, with no degradation, advective processes, or intermedia transport processes (eg wet deposition or sedimentation). The medium receiving the emission is considered unimportant because it is assumed the chemical is instantaneously distributed, reaching an equilibrium condition.

The model requires information on physico-chemical properties for the chemical of interest, including log Kow, water solubility and vapour pressure. Where the physico-chemical properties of a chemical were found to differ, for example where very different values were located for solubilty and log Kow for the herbicide MCPA, the model was

run a number of times to assess the variation in the results from using different values for the physico-chemical parameters.

The model allows for three different types of chemical:

- Type 1 – chemicals that partition into all media
- Type 2 – chemicals that are involatile; that is they do not partition appreciably into air
- Type 3 – chemicals that partition into air, biota and solid phases such as soil and sediment, but they are essentially insoluble in water.

Type 1 was used as Types 2 and 3 require a range of data that is not generally readily available.

2.2.3 Review

The prioritisation approach also incorporates a process for reviewing the priority rankings. The initial results from the prioritisation process were reviewed by up to four internal reviewers with expertise in chemical usage, international programmes and industrial processes. Although the review process did not involve detailed discussion of all the data used to determine the priority ranking, it served a number of purposes:

- it enabled a check on the score assigned and flagged any anomalies;
- it gave an opportunity for further data sources to be highlighted;
- it enabled discussion about how particular substances should be dealt with, eg should they be taken forward for EQS development or should additional data be obtained or were other controls in place which perhaps reduce the need for an EQS.

Due to time constraints not all substances could be reviewed and therefore we focused attention on those substances identified as high priority (with a priority ranking of either 1 or 2). It is possible therefore that substances whose ranking might have been underestimated were not be reviewed. At this stage, there are more confirmed high priority substances than we can develop EQSs for, however the remaining substances should be reviewed before any future recommendations are made in relation to these chemicals.

2.2.4 Identifying the first tranche of chemicals for EQS development

Due to time constraints, EQS derivation needed to start at the same time as the development of the prioritisation approach. As a result, the first tranche of chemicals put forward for EQS development had to be identified prior to development of a formal prioritisation scheme.

In 2004, the Programme of Measures Task Team (POMTT) Water Quality Group drew up a list of chemicals of potential concern from a review of permits across the UK that contained numeric limits for substances. Key chemicals were identified from this list by geographical significance (substances appearing in more than one list) and by frequency of application (number of permits) to produce an initial list of substances of concern (See Section 3.3)

3 Results of the prioritisation exercise

3.1 Universe of Chemicals

The results of the prioritisation of chemicals included in the 'Universe of Chemicals' are summarised in Table 3.1. This shows the number of chemicals assigned priority rankings of 1 to 5 along with the number that could not be prioritised due to insufficient information. This does not include those substances included on the Universe of Chemicals due to presence on List 2 of the Dangerous Substance Directive. These were considered separately (See Section 3.2). Approximately 70 chemicals were ranked as either 1 or 2.

Table 3.1 Summary of the results of the prioritisation exercise for the 'Universe of Chemicals'

Priority Ranking	Number of chemicals assigned ranking
1	23
2	46
3	19
4	4
5	60
Insufficient information	124

The review exercise concluded that not all the substances identified as high priority, ie 1 or 2 should be put forward for consideration for EQS development at this stage. This was for a number of reasons including:

- The need for additional data - the lack of monitoring data on mancozeb for example, was highlighted as an issue that needed to be addressed before a decision on EQS derivation could be made. Consequently it has been included on the Environment Agency's Targeted Risk Based Monitoring programme. Decisions on several other chemicals were put on hold until further data was located, e.g. for 1,2-dichlorobenzene, information on UK use data was identified as a need before a decision could be made on whether to take the substance forward for EQS derivation.

- Further consideration of the available data on which the ranking was based. The pesticides azinphos-ethyl and parathion-methyl, for example, were both identified as not approved for use in the UK or EU but were detected in water and therefore gained an exposure score. However although both were detected it was in a very small number of samples compared with the total number of samples taken (0.15% and 0.09% respectively) and therefore during the review process it was proposed that based on current use scenarios and the relatively limited number of detections, the substances were not of concern and should not be taken forward for EQS derivation

- Awaiting the outcome of current work, for example reviews undertaken in relation to the EU Plant Protection Product Directive (PPPD) and risk assessments and risk

management strategies produced under ESR. The outcomes of both these initiatives can have an impact on the potential use of a chemical. For example if a review under the PPPD indicates a potential risk then use may not be permitted in the EU and an EQS is not needed. Similarly, ESR risk assessments can identify whether there is an actual concern about the use of a chemical, meaning risk management strategies may be developed which avoid the need for an EQS.

- Awaiting the outcome of a current investigation into a substance. One example is mevinphos, which although not approved for use has been found to be present in the environment at concentrations above the EQS. This along with its hazardous properties indicated a high priority. However as local investigations are taking place into the EQS exceedance to identify potential sources it was proposed that this substance was put on hold until information from these investigations is available.

- Controls are already in place that will affect the chemical of interest. For example nonyl phenol ethoxylates (NPEs) were identified as Priority 1 candidates, however they are already subject to control and the degradation product, nonyl phenol, which is the main concern, is already an Annex X substance with an EU EQS. Deriving an EQS for NPE was therefore not considered to provide any significant additional benefit.

Based on the prioritisation exercise and the review stage, the following chemicals were put forward as candidates for EQS development:

Glyphosate *
17β oestradiol *
PFOS (perfluorooctane sulphonate) *
Triclosan *
17α ethinyloestradiol *
Benzyl butyl phthalate *
Carbendazim
Methiocarb
Pendimethalin *
Chlorothalonil *
3,4-dichloroaniline *

* refers to substances for which EQSs are currently being derived

Fugacity modelling has been undertaken for those substances identified as candidates for EQS development. The results of the modelling are shown in Table 3.2. It shows the modelled distribution between water, sediment, soil and air. The model also indicates % distribution to aeosols, suspended sediment and fish however as these were generally negligible they have not been included in Table 3.2.

Table 3.2   Results of the fugacity modelling undertaken (% distribution in water, sediment, soil and air)

Chemical	Water	Sediment	Soil	Air
Glyphosate	100	-	-	-
Carbendazim				-
	97.3	0.059	2.66	0.000047
Chlorothalonil				
Methiocarb	59.1	0.882	39.7	0.297
17α-ethyinyloestradiol	54.2	0.995	44.8	0.003
	19.1	1.76	79.1	-
17β-oestradiol				
Triclosan	9.74	1.96	88.2	-
Benzyl butyl phthalate	1.72	2.13	96.1	0.005
	1.34	2.14	96.4	0.036
Pendimethalin				
PFOS	0.68	2.15	96.6	0.47
	ND			ND

ND – not determined. A log Kow value was not available for PFOS and therefore it could not be modelled.

The results of the fugacity modelling did not influence the decision to take any of the above substances forward for EQS development. Even though the modelling indicated a number of chemicals, such as triclosan and the steroid oestrogens, would have a low distribution in the aquatic environment, actual monitoring data indicated presence in the environment. The monitoring data supported the decision and the fugacity modelling did not affect the decisions made.

As shown in Table 3.1 a large number of chemicals could not be prioritised due to a lack of data. These substances were reviewed to identify whether 'Insufficient information' was due to lack of exposure or hazard data or both. The information in Table 3.3 shows that lack of exposure or hazard data contributed equally to the classification of 'Insufficient information' and approximately one quarter of the substances were classified as such due to lack of both hazard and exposure data

Table 3.3   Summary of missing data for those substances assigned 'Insufficient data'

Insufficient exposure data	Insufficient hazard data	Insufficient exposure and hazard data
48	42	34

Further detail on the results of the prioritisation is provided in Appendix 4. This includes details of the exposure and hazard scores for each chemical as well as the overall priority ranking, along with general comments on the data set and outcomes of the review process where available.

3.2   Prioritisation of List 2 chemicals

The substances identified as List II under the Dangerous Substance Directive were prioritised separately from the other chemicals in the 'Universe of Chemicals' following a specific request from Defra which meant the results were required at an early stage. The list comprised those substances included in the Surface Waters (Dangerous Substances) (Classification) Regulations 1997 and 1998. For completion, although not specifically requested by Defra, substances included in Department of the Environment Circular 7/89 were also prioritised. The resulting list comprised 44 substances but the following steps were undertaken prior to prioritisation:

- substances already identified as WFD Annex X Priority Hazardous Substances/Priority Substances were removed;
- substances included in the first tranche of substances for EQS development (see section 2.2.5) were excluded;
- chemicals that are no longer used in the UK were removed following contact with Pesticides Safety Directorate, Veterinary Medicines Directorate and the Health and Safety Executive;
- chemicals not suitable for consideration under the prioritisation process were removed. This included metals and other inorganic substances, such as boron, triphenyltin and vanadium.

After these procedures were applied, 17 substances remained for prioritisation (see Appendix 4). None of the substances were identified as Priority 1, however six substances were identified as Priority 2 and put forward for EQS development:

- 2,4-D (ester and non-ester)
- 2,4-dichlorophenol
- dimethoate
- fenitrothion
- linuron
- mecoprop

Fugacity modelling was undertaken for these six chemicals and the percentage modelled distribution between air, water, sediment and soil is shown in Table 3.4.

Table 3.4   Results of the fugacity modelling undertaken (percentage distribution in soil, sediment, water and air)

Chemical	Water %	Sediment %	Soil %	Air %
Mecoprop	98.4	0.035	1.59	0.001
Dimethoate	68.3	0.69	31	0.0001
2,4-D	63.1	0.8	36.1	0.00006
Linuron	52.4	1.03	46.4	0.08
2,4-dichlorophenol	46.4	1.05	47.1	5.42
Fenitrothion	31.5	1.49	66.9	0.05

Fenitrothion was removed from the list. Its high ranking was partly driven by two pieces of available monitoring data which indicated exceedance of the EQS. However this data was not considered sufficiently reliable for use in prioritisation. In addition fugacity modelling suggested that fenitrothion was unlikely to be found in the water column (see Table 3.4).

The prioritisation methodology was not considered suitable for boron, vanadium and triphenyltin, and therefore they had to be considered separately. Monitoring data was compared with the EQSs to gain an indication of concern. As a result boron and vanadium were not considered to be a priority as concentrations detected did not exceed the EQS, but triphenyltin remains a potential candidate for EQS derivation because it was detected at levels in excess of the current EQS. However this assessment was based purely on exposure with no consideration of relative hazard.

3.3   First tranche of chemicals put forward for EQS development

As noted in Section 2.2.5, whilst the prioritisation process was being developed, a first tranche of 15 substances was identified for EQS derivation, based on a review of discharge consents across the UK. The selection of these substances was based on both geographical extent and frequency of occurrence on discharge permits. Cypermethrin was subsequently added to this list of chemicals, reflecting concerns about the risks to aquatic life arising from its use as the active ingredient in sheep dip products. This brought the list of substances put forward for an initial tranche of EQS development to 16, namely:

- Aluminium
- Ammonia
- Arsenic
- Chlorine
- Chromium
- Cyanide
- Cypermethrin
- Copper
- Diazinon
- Iron

- Manganese
- Permethrin
- Toluene
- Tetrachloroethane
- Phenol
- Zinc

Prioritising chemicals for standard derivation under Annex VIII of the Water Framework Directive

4 Discussion

The prioritisation approach described here has enabled a large number of chemicals to be ranked for consideration for EQS development.

However, in using the approach to prioritise the chemicals on the Universe of Chemicals, a number of issues arose which are summarised below. Many of these were addressed during the prioritisation exercise but some will require consideration before further exercises are carried out.

4.1 Data availability and quality

The prioritisation process requires a wide range of exposure and hazard data to be gathered on individual chemicals. The availability and quality of these data are key factors within the process.

The data used should be of high quality where possible to ensure that decisions made are soundly based. Due to the number of chemicals being considered it was not practicable to check whether the data points arose from recognised studies as recommended in the prioritisation guidance (See Appendix 3). However, data were obtained where possible from quality checked and/or peer reviewed documents, or recognised databases. They were therefore subject to a quality assurance step.

In many cases the assessment was based on a substantial data set. However, in others ranking was based on a limited dataset with only a few or maybe a single data point. The size of the dataset is masked once the score is assigned, however this factor was considered as part of the review process. In many cases it was proposed that additional data should be obtained before a decision was made, for example monitoring data was requested for mancozeb and further detail on the use of 1,2-dichlorobenzene was recommended before EQS development should be considered. This showed the value of a review stage as it allowed expert advice to be incorporated into an otherwise mechanistic process.

Many substances could not be prioritised due to a lack of data. Although this prevents their consideration for EQS development at this stage, it highlights data gaps for consideration in the future. Lack of exposure or hazard data contributed equally to the classification of 'Insufficient information' and therefore one type of data did not predominate as the reason for our inability to prioritise substances.

4.2 Exposure

Data on tonnage used and use scenarios were generally limited. Where data were available, particularly for industrial chemicals, it did not usually relate to the UK and therefore had to extrapolate from European or worldwide figures to get an estimate for the UK. In addition many of the use and tonnage data, again for industrial chemicals, were old and related to production rather than use. Such issues were raised and considered at the review stage and often led to the decision that further data were required before a decision to make substance a candidate for EQS development could be made.

There is the potential for bias when considering monitoring data. The monitoring score is related to whether a substance has been detected regionally or nationally (latter

defined as >2 Regions) and also whether there are any exceedances of existing EQSs and PNECs. For those substances without an existing EQS the highest exposure score possible is 2, even if they are found widely at relatively high concentrations. This can limit the overall exposure score, which in turn can affect the overall priority ranking if monitoring data is the sole measure of exposure. This was considered when reviewing the priority rankings and was addressed by comparing concentrations detected with reported effect concentrations to give an indication of whether the concentrations found may be of concern.

When assessing EQS exceedances the guidance does not specify whether comparison is with a short term Maximum Allowable Concentration (MAC) or long term (Annual Average (AA)) standard. There are circumstances where the result may be different depending on which value is used. For chlorpropham, for example, the AA was not exceeded but one sample resulted in an exceedance of the MAC. In this case the sample result was not considered reliable but it raises an issue that may need to be considered in future prioritisation exercises when assigning an exposure score.

In the prioritisation guidance, detection is defined as a concentration that exceeds 0.1 µg/l in surface water or any positive detection in groundwater. Therefore the thresholds vary for surface and groundwaters. This could bias the result for those substances that have been monitored widely in groundwater compared to surface water and is a discrepancy that invites further consideration.

4.3   Hazard assessment

Persistence is one of the criteria used to assess the potential hazard of the chemical in the aquatic environment. Data considered include half-lives in water and sediment and ready biodegradability. Data for sediment were rarely available so most assessments were made using water half-lives and ready biodegradability studies.

Degradation in water may be a result of biotic processes (biodegradation) and/or abiotic processes such as hydrolysis and photolysis, however for many chemicals data were not available for both processes. As loss of a chemical is often dominated by one type of removal process it is possible that the available data do not truly reflect persistence. Where biodegradation, for example, is the key degradation process for a chemical, if data is only available for an abiotic process such as hydrolysis, persistence may not be adequately reflected and vice versa. Such cases were discussed at the review stage, eg 6,6-di-*tert*-butyl-2,2-methylene-di-*p*-cresol.

A further consideration is that the prioritisation methodology proposes the use of the worst case data for each criterion. For example if the water half life suggests a chemical does not meet the criterion for persistence but the ready biodegradation data does then the latter is used to classify persistence and to derive a hazard score. For those chemicals which are rapidly degraded via abiotic processes but are not readily biodegraded a high score for persistence may be assigned although in reality it is degraded quite rapidly. Again such cases were discussed at the review stage, such as for 2,6-di-*tert*-butyl-*p*-cresol BHT).

There are a number of abiotic processes including hydrolysis and photolysis. Different processes may be key for different chemicals and therefore if data is not available for each this needs to be considered - the most dominant removal process may not have been identified from the available data. Again this issue was discussed during the review stage.

Bioaccumulation requires BCF and/or log Kow data to be considered. A BCF is an experimentally derived value potential of a chemical, whilst log Kow provides an estimate of a chemical's potential to bioaccumulate based on physical chemical properties. In a few cases the BCF and log Kow values gave conflicting results, for example where log Kow indicated a potential to bioaccumulation but this was not supported by the BCF values. The prioritisation methodology proposes the use of the worst case value in deriving the bioaccumulation score. However in such cases further consideration of the data is required. These differences can reflect the fact that although predictions based on physico-chemical properties suggest bioaccumulation, this does not occur in practice due to factors such as the size of the molecule preventing take up by the organism thus preventing bioaccumulation. Hence taking the worst case value may overestimate bioaccumulation.

A chemical classified as very persistent (vP) and very bioaccumulative (vB) but not toxic would be given a hazard score of 4. However a classification of very persistent (vP) and highly bioaccumulative (HB) but not toxic gives a hazard score of 0. Therefore a slight difference in bioaccumulation potential can result in a significant difference in hazard score which can have a significant effect on the overall priority ranking, with a hazard score of 0 resulting in a priority ranking of 5. Some of the hazard scoring for certain hazard classification combinations may need to be re-considered.

Toxicity was assessed based on actual results from laboratory tests. Quantitative Structure Activity Relationship (QSAR) studies, which predict toxicity based on knowledge of the molecular structure of a chemical, were not used for the purposes of this exercise. It should be considered whether QSAR data should be used in future prioritisation exercises for those substances where no or limited toxicity data is available.

4.4   Fugacity modelling

Fugacity modelling was included as part of the verification stage of the prioritisation process as an additional tool to help assess the potential exposure to a chemical in the aquatic environment.

Due to limited data availability, it was necessary to run the simplest level of fugacity assessment (Level 1). This predicts distribution in the environment based on instantaneous release rather than following introduction via a particular medium, eg discharge to the aquatic environment. Therefore although use of the Level 1 fugacity modelling will indicate the potential for a chemical to distribute to the water environment, it does not truly reflect the situation where the chemical is discharged directly to the water environment. This needs to be considered when interpreting the fugacity model results.

The fugacity modelling showed that for a number of chemicals, limited presence in the water environment is predicted based on their physical chemical properties. These substances include the steroid oestrogens ethinyl oestradiol and oestradiol as well as benzyl butyl phthalate and pendimethalin. However since actual monitoring data has shown they are present in the environment, this casts doubt on the benefits of using fugacity modelling at this level. Although it was useful in deciding whether to take fenitrothion through to the next stage, it did not help the decision making process for the other chemicals reviewed.

4.5 Review process

The review process was part of the verification and validation step of the prioritisation approach and it provided a useful opportunity to consider the results arising from the ranking exercise. The prioritisation method is a mechanistic approach with data being located and used to assign a priority ranking. The review process provided an opportunity to consider and discuss the rankings and enabled:

- consideration of the confidence and uncertainty in the data and data sources used, enabling limited data sets to be identified along with rankings based on non-peer reviewed data
- the opportunity to identify further data sources for consideration
- discussion of recommendations on how to proceed with specific chemicals taking into account the results of the prioritisation, the basis of the ranking (eg confidence in the data), and also surrounding issues not picked up within the prioritisation process (eg existing controls and initiatives).

There was not time to review all of the substances that were prioritised so focus was placed on those substances that were identified as priority 1 or 2. Those substance that were not reviewed should be subject to review prior to any recommendations being made on next steps for those particular substances.

4.6 Scope of the prioritisation approach

The current methodology is suitable for organic chemicals but not metals and other inorganic chemicals. The latter were therefore excluded from this prioritisation exercise although an attempt was made to consider the List II substances boron, vanadium and triphenyltin by comparing monitoring data with the EQSs. However this fails to consider potential hazard and therefore an appropriate approach needs to be developed to be able to prioritise these types of chemicals.

5   Conclusions

A candidate list of chemicals ('Universe of Chemicals') was drawn up based on existing regulatory obligations and commitments as well as national initiatives such as the Environment Agency's reviews on pharmaceuticals and veterinary medicines. This list has enabled identification of chemicals to be considered for prioritisation at this stage however it is not a fixed list and additional chemicals can be added to the list in the future.

The Environment Agency's Chemical Screening and Prioritisation method was chosen as the approach to be used to prioritise substances for consideration for EQS development. It is a method that meets the requirements of the IMPRESS guidance and with which we already had some experience. It was modified for the purposes of this exercise to only assess impacts on the aquatic environment.

The prioritisation process ranks substances based on their potential exposure in the aquatic environment and hazard to aquatic life. The prioritisation exercise identified approximately 70 substances as high priority (26 Priority 1 and 46 Priority 2) and therefore potential candidates for development of EQSs under Annex VIII of the WFD.

A review process has proved useful in considering the outcomes of the rankings arising from the prioritisation exercise. As a result of the review additional data sources have been identified and recommendations have been made on how to proceed with those chemicals identified as high priority. This has included identifying where further information is needed, awaiting the results of on going work such as ESR risk management strategies, or putting the substance forward for EQS development.

At this stage a total of 32 substances have been identified for EQS development as a result of the prioritisation exercise undertaken on the 'Universe of Chemicals' (including the List 2 chemicals) and the review of discharge permits. EQSs are currently being derived for 30 of these chemicals. A number of other substances were identified as of high priority based on the prioritisation process but were not put forward for EQS development at this stage due to a need further information. These substances will need to be reconsidered as additional data becomes available. In addition, due to time constraints, the review process focused on those substances that were ranked as Priority 1 or 2. The other substances need to be reviewed before any decisions are made on these chemicals.

The exercise has highlighted a number of issues that need consideration when using the prioritisation process. These include limited availability of usage data and the need to consider data on persistence and bioaccumulation more broadly. Many of these issues have been able to be addressed at the review stage and this supports the need for inclusion of this within the overall prioritisation process. However a number will need to be addressed before further prioritisation exercises. This includes use and interpretation of fugacity modelling. The latter was included as a tool to help assess potential exposure in the aquatic environment but due to data limitations it provided limited benefit during this particular exercise and the use of this approach in future exercises needs to be considered.

References

European Commission, 2003. Analysis of Pressures and Impacts. Guidance Document No.3

Environment Agency, 2003. Targeted Monitoring Programme for Pharmaceuticals in the aquatic environment. R&D Technical Report P6-012/06/TR

Roberts, A. AND Millar,G., 2004. Guidance on Risk Based Approach to Identifying Specific Pollutants: Options Paper (Draft). UK Technical Advisory Group

UK Technical Advisory Group, 2005. Development of an approach for the prioritisation of Annex VIII chemicals for EQS development.

Abbreviations

AA	Annual Average
B	Bioaccumulative
BCF	Bioconcentration Factor
COMMPS	Combined Monitoring-Based and Modelling-Based Priority Setting
CSL	Central Science Laboratory
EHC	Environmental Health Criteria
EPER	European Pollutant Emission Register
EQS	Environmental Quality Standard
ESR	Existing Substances Regulations
HB	Highly bioaccumulative
HP	Highly persistent
HSDB	Hazardous Substance Database
HT	Highly Toxic
MAC	Maximum Allowable Concentration
OECD	Organisation for Economic Co-operation and Development
OSPAR	Oslo and Paris Commissions for the protection of the marine environment of the NE Atlantic
P	Persistent
PBT	Persistent, bioaccumulative and toxic
PFOS	Perfluorooctane sulphonate
PNEC	Predicted No Effect Concentration
PPPD	Plant Protection Products Directive
QSAR	Quantitative Structure Activity Relationship
SIDS	Substance Identification Datasheet
SNIFFER	Scotland and Northern Ireland Forum for Environmental Research
T	Toxic
TAG	Technical Advisory Group
VB	Very bioaccumulative
VP	Very persistent
VT	Very toxic
WFD	Water Framework Directive

Appendix 1. IMPRESS generic approach for identifying Specific Pollutants

1. Starting point.
The indicative list of main pollutants is set out in Annex VIII of the Directive. Only those pollutants under points 1 to 9 need further consideration as potential specific pollutants (points 10, 11 and 12 are general physico-chemical QEs).
2. Screening.
A screening of all available information on pollution sources, impacts and production and usage as described in (a) and (b) below.
(a) Collation of information. Data:　- Source/sectoral analyses, production processes, usage, treatment, emissions. 　　　- Impacts, water quality monitoring data, special surveys. 　　　- Physico-chemical properties to determine pathways. Information from existing obligations and programmes: Priority Substances, DSD 76/464, UNEP POPs list, EPER, COMPPS, Results of 793/93, users lists, etc.
(b) Deriving a list of pollutants. Assessment of information collected under step 2(a) will result in a working list of those pollutants identified as being discharged into water bodies. Most of these pollutants will be selected by the combination of a top-down and bottom-up approach.
3. Test for relevance.
Step 3 selects from the list those pollutants that are likely to cause, or to already be causing, harm to the environment. Selection should ideally be based on an assessment of the environmental significance of the concentrations (and trends in concentrations) estimated for the pollutants or their breakdown products in the water bodies. Two sub-steps are suggested:
(a) Obtaining data on concentrations in, and loads to surface water bodies: 　　　- By monitoring i.e. measured data. 　　　- By modelling i.e. estimate data.
(b) Comparing concentrations with benchmarks: Pollutants identified under step 2 may be excluded, where their concentrations are estimated to be lower than the most relevant critical value such as EQS, LC50, NOEC, PNEC or critical load. EQS - where possible, monitored or estimated concentrations should be compared with the appropriate EQS; Critical loads – identified for some reduction programmes (e.g. North Sea Conference). Only critical loads need be considered in identifying specific pollutants.
Further remarks: 　　　- Natural background concentrations may exceed EQSs for non-synthetic pollutants. 　　　- Potential accumulations in sediment or biota should be considered.
4. Safety net.
To avoid excluding substances incorrectly the following safety net is advised: 　　　- Consider combined affects of minor pollution sources 　　　- Consider trends which may indicate increasing importance of a pollutant 　　　- Consider presence of pollutants with similar modes of toxic action and potentially additive effects.
For some pollutants the assessments made in steps 2 and 3 may not provide adequate confidence that a pollutant is either not being discharged or not presenting a significant environmental risk. Further investigations should be made to improve confidence in the selection procedure to identify these pollutants as a specific pollutant.
5. Final outcome.
The final outcome must be a list of *specific pollutants* relevant to a river basin district or to particular water bodies within a river basin district.

Appendix 2: Drivers used to develop a 'Universe of Chemicals'

An outline of the various obligations and data sources used in the compilation of the 'Universe of Chemicals is provided below.

Existing Monitoring Obligations

The Shellfish Water Directive

The Shellfish Water Directive (79/923/EEC) lays down the standards required to ensure a suitable environment for shellfish growth in designated brackish and coastal waters. In England and Wales there are monitoring requirements for 13 chemical parameters.

The Freshwater Fish Directive

The Freshwater Fish Directive (78/659/EEC) requires Member States to designate freshwaters requiring protection in order to support fish life under favourable conditions. In England and Wales there are monitoring requirements for 4 chemical parameters.

The Bathing Water Directive

The Bathing Water Directive (76/160/EEC) defines the standards that are acceptable to both fresh and marine waters designated for bathing or where bathing has traditionally been practised by a large number of bathers. In England and Wales there are monitoring requirements for 3 chemical parameters.

National Marine Monitoring Programme

The National Marine Monitoring Programme (NMMP) was initiated in the late 1980s to co-ordinate marine monitoring in the UK between a number of organisations. The NMMP aims to detect long-term trends in the quality of the marine environment, to ensure consistent standards in monitoring, to establish appropriate protective regulatory measures, to co-ordinate and optimise marine monitoring in the UK. In England and Wales there are monitoring requirements for 42 chemical parameters.

Environmental Change Network

The UK Environmental Change Network (ECN) is the UK's long-term, integrated environmental monitoring and research programme. ECN gathers information about the pressures on and responses to environmental change in physical, chemical and biological systems. It is supported by a consortium of fourteen sponsoring organisations and eight research organisations. In England and Wales there are monitoring requirements for 40 chemical parameters.

Existing Obligations

The Dangerous Substances Directive

In 1976 the Dangerous Substances Directive (76/464/EEC) was adopted with the aim to control pollution caused by certain dangerous substances discharged to the aquatic environment. The Directive established two lists of substances:

> List I - dealing with substances regarded as being particularly dangerous because of their toxicity, persistence and bioaccumulation;
>
> List 2 - containing substances which are less dangerous but which nevertheless have a deleterious effect on the aquatic environment.

EQSs are noted as one of the approaches for the control of chemicals into the environment. EU required to set standards for List 1 and Member States for List 2 substances.

List 1

In 1982 the Commission drew up a list of 129 candidate List 1 chemicals to which 3 further chemicals were subsequently added. Of these 18 were confirmed as List 1 and EQSs were derived by the EU.

List 2

The UK have derived EQS for approximated 100 chemicals of which x have been made statutory through inclusion in the Surface Waters (Dangerous Substances) (Classification) Regulations 1997 and 1998.

Protection of the North Sea – Red List and Hazardous Substances List

Two lists, the UK Red List Initiative (23 substances) and a list of 'Priority Hazardous Substances' (36 substances) have been pulled together as a result of the Second and Third Ministerial Conferences on the Protection of the North Sea respectively.

The selection of Red List substances was made for the list of 129 potential list 1 substances published by the European Commission in 1982. While the list of 'priority hazardous substances ' agreed at the later conference, includes all the Red list substances (except PCBs)

Oslo and Paris (OSPAR) Commission – list of chemicals for priority action

The main objective of the OSPAR Commission is to protect the marine environment so as to safeguard human health through the elimination or prevention of pollution. The Priority Action List consists of three categories; A, B and C. Only Category A substances have been included in the Universe of Chemicals (a total of 32 substances) since category B substances are used in closed systems and therefore unlikely to be emitted to the environment. Category C substances are not currently used in OSPAR states, including the UK.

OSPAR veterinary medicinal products used in aquaculture

The main aim of the OSPAR Commission is to protect the marine environment so as to safeguard human health through the elimination or prevention of pollution. These reporting requirements concern PARCOM recommendation 94/6 on Best

Environmental Practice (BEP) for the Reduction of Inputs of Potentially toxic Chemicals from Aquaculture Use. A apparent list of 4 substances has been identified in the consultation document 'Consultation on proposed changes to the UK Pollutant Release and Transfer Registers (PRTRs) for 2005 to 2007'. Although this still needs to be inserted.

European Pollutant Emission Register (EPER)

The EPER requires Member States to report on emissions to air and water of specified substances. Twenty six substances have been identified for inclusion on the EPER in terms of recording emissions to the aquatic environment. These were identified on the basis of inventories from significant licensed industrial activities across Europe.

Also considered under this are
Aarhus Convention substances (Water) **-** The Aarhus Convention was signed by the European Community in 1998. The aim was to establish both national and European pollution release and transfer registers (PRTRs), specifying a range of pollutants for which emissions above specified threshold values should be reported by specified industries. A provisional list of 62 pollutants was given for water (of these 29 are currently on EPER list: therefore 33 'new' substances
European Pollutant Release and Transfer Register (E-PRTR) - As the European PRTR is a development of the Aarhus Convention, the range of substances to be reported for water is almost identical to that for the Aarhus driver. However, a further seven substances have been included. Monitoring for both Aarhus substances and the E-PRTR is a 'statutory' obligation and therefore both drivers must be included. Of the substances on the E-PRTR list 9 are on neither the EPER or the Aarhus list – Therefore 9 'new' substances

The Stockholm Convention on Persistent Organic Pollutants (POPs)/United Nations Environmental Programme – POPs

The Stockholm Convention is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). In implementing the Convention, Governments will take measures to eliminate or reduce the release of POPs into the environment. Twelve chemicals have been identified as UNEP POPs under the convention.

Other data sources

Combined Monitoring Based and Modelling Based Priority Setting (COMMPS)

The COMMPS procedure was developed as a prioritisation tool to identify substances for consideration under Annex X of the WFD. Thirty three substances have been identified as priority substances for Annex X of the WFD.

Pesticides of Possible Relevance

Surveys of pesticide usage on a variety of agricultural and horticultural crops for England, Wales and Scotland are undertaken by the Central Science Laboratory (CSL). These result in reports on pesticide use on different crop types as well as 10year review of pesticide usage across all crops throughout Great Britain. The most recently reported 10 year study was published in 1996. It lists the fifty most widely used pesticides (in terms of weight applied) across all crops throughout GB. This list

was included in the Universe of Chemicals (The next report, due in 2006 was not available at the time).

Existing Substances Regulation (ESR) substance of potential risk in UK

The 19 substances provided in this list have been recognised as of potential risk in the UK from either international risk assessments (EU chemicals legislation e.g. Existing Substance Regulations (ESR)) or from a national risk assessment carried out by the Environment Agency (Chemical Assessment Unit).

Substance is of direct concern to the Environment Agency and SEPA

Substances identified by the Environment Agency, SEPA and Northern Ireland representatives on the UK's Chemical Task Team.

UK Chemicals Stakeholder Forum

The forum has set out criteria to identify chemicals of concern based on their hazardous properties. A study by the Environment Agency identified which of those chemicals produced and used In high volumes in the EU (a mass over 1000 tonnes per year) met these criteria, based on information available to the Environment Agency at the time.

The Groundwater Directive

The Directive on the protection of groundwater against pollution cause by certain dangerous substances (80/68/EEC) requires Member States to prevent the introduction into groundwater of List I substances and to limit the introduction of List II substances so as to prevent pollution.

In the UK, JAGDAG was established to determine which substances should be included within Lists I and II under the Groundwater Directive. The current number of chemicals determined as List 1 or List II stands at 454.

Given that the requirement under this Directive is to prevent or limit the introduction of List I or List II substances into groundwater it is felt important to include this list of chemicals in the WFD specific pollutants prioritisation process.

Veterinary Medicines

Veterinary medicines are widely used to treat disease and protect the health of animals. In order to gain a greater understanding of the potential environmental risks arising from the use of veterinary medicines, the Environment Agency, in 2002, commissioned a review of the information in the literature. The data collated was used to identify those veterinary medicines of most significant environmental concern. A total of 56 compounds were assigned to the high priority category (although there was only sufficient data available to characterise the potential risk to various environmental compartments for eleven of these). (Ref R&D Technical Report P6-012/8/TR Review of Veterinary Medicines in the Environment)

Human Pharmaceuticals

The Environment Agency reviewed available data on the occurrence, fate and effects of human pharmaceuticals in the environment and identified substances of potential concern using the EU Technical Guidance Document on risk assessment (1996). The review is currently being updated with useage data for 2004 but that report is currently not available. Based on this review twelve substances were identified as of potential concern and were included in a Targeted Monitoring Programme for Pharmaceuticals in the Aquatic Environment (P6-012/06/TR) commissioned by the Environment Agency.

Endocrine disrupting substances

Endocrine disruptors are substances of increasing concern in the environment. The EU commissioned work to identify a priority list of substances of concern in relation to endocrine disrupting potential. This involved a review of their potential ED effect and also their persistence and tonnage used. The report produced by BKH in 2000 identified 66 Category 1 substances.

Appendix 3: Methodology for prioritising substances for EQS development under the Water Framework Directive

The approach for prioritisation is outlined in figure 1 and 2.

ENTRY INTO PROCESS

HAZARD ASSESSMENT

Is it classified as Persistent (P), Bioaccumulative (B) or Toxic (T) in water by ecotoxicological information?

- not classified => **0**
- T => **1**
- PT or BT or (HT) => **2**
- PBT or P(HT) or B(HT) or v(HT) => **3**
- P(HB)(HT) or vPvB? => **4**

NB: See Appendix C3,C4 & C5 for definitions of these classifications, scoring & suitable tests

Classified

EXPOSURE ASSESSMENT

USE ASSESSMENT

A. How much is used annually in UK
B. What is the use pattern* in UK
- Controlled system (isolated intermediate)=> **0.1**
- Industrial (non-dispersive) use => **0.2**
- Wide dispersive use (mainly diffuse sources) => **0.5**
- Used in the environment =>**1**

NB: See Appendix 4 for Use Pattern criteria (definitions)

C. Annual use fig. x Use index=>
- 0-1 => **0**;
- 1-10 => **1**;
- 10-100 => **2**;
- 100-1000 => **3**;
- >1000 => **4**

MONITORING INFO ASSESSMENT

Is the substance detected in any media in UK
- not detected* => **0**
- detected* => **1** (**2** if biota)
- detected* nationally => **2** (**4** if biota)
- > ES* or PNEC* => **3**
- > ES* or PNEC* nationally => **4**

* NB: See Appendix C 4 for definitions of national and ES and appendix C5 for suitable data

EXPOSURE ASSESSMENT SCORE is taken as the highest score: USE or MONITORING assessment unless latter is available for all media (soil, surface water, ground water & biota)

RISK RANKING (Hazard vs. Exposure assessment)

Combine HAZARD & EXPOSURE ASSESSMENT scores to give risk ranking:

	Exposure assessment score				
	4	**3**	**2**	**1**	**0**
4	1	1	2	3	5
3	1	2	2	3	5
2	2	2	3	4	5
1	3	3	4	4	5
0	5	5	5	5	5

(Hazard assessment score on left axis)

VERIFY & VALIDATE DATA

CHEMICAL OF CONCERN

Figure 1.

Hazard Assessment – Classification in terms of PBT criteria

PART 1: PERSISTENCE

HALF-LIFE IN WATER

Criteria	HAZARD CRITERIA
> 20 days (fresh or marine water)	P
> 40 days (Freshwater) or > 60 days (Marine water)	HP
> 60 days (fresh or marine water)	vP

HALF-LIFE IN SEDIMENT

Criteria	Hazard criteria
>60 days (fresh or marine water)	P
>120 days (Freshwater) or >180 days (Marine water)	HP
>180 days (fresh or marine water)	vP

GENERAL PERSISTENCE OTHER CRITERIA

Criteria	Hazard criteria
lack of Achievement of pass level in 'ready biodegradability' or equivalent	vP

Part 2: Bioaccumulation

BIOCONCENTRATION FACTOR (BCF)

Criteria	Hazard criteria
> 500	B
>2000	HB
>5000	vB

Log K_{ow}

Criteria	Hazard criteria
>4	B
>4.5	HB
>5	vB

2.1.1 PART 3: TOXICITY

AQUATIC SPECIES: ACUTE L(E)C$_{50}$ TESTS (**MG/L**)

Criteria	Hazard Criteria
<1	T
<0.1	HT
<0.01	vHT

Aquatic species: Chronic NOEC tests (mg/l)

Criteria	Hazard Criteria
<0.1	T
<0.01	HT
<0.001	vHT

SUSPECTED OR KNOWN ENDOCRINE DISRUPTING (ED) EFFECTS => HT

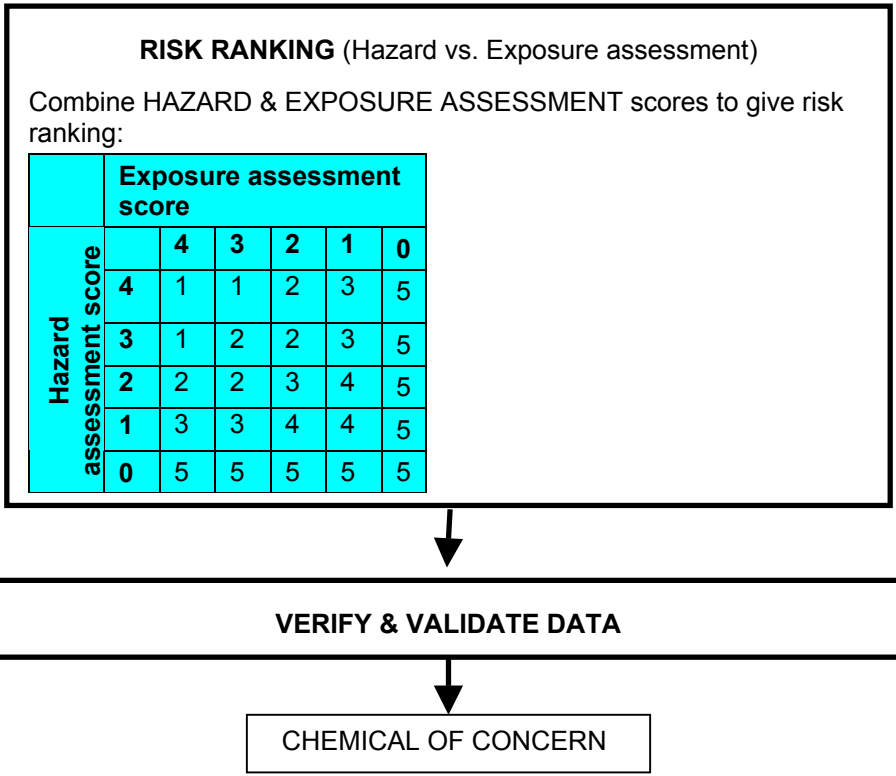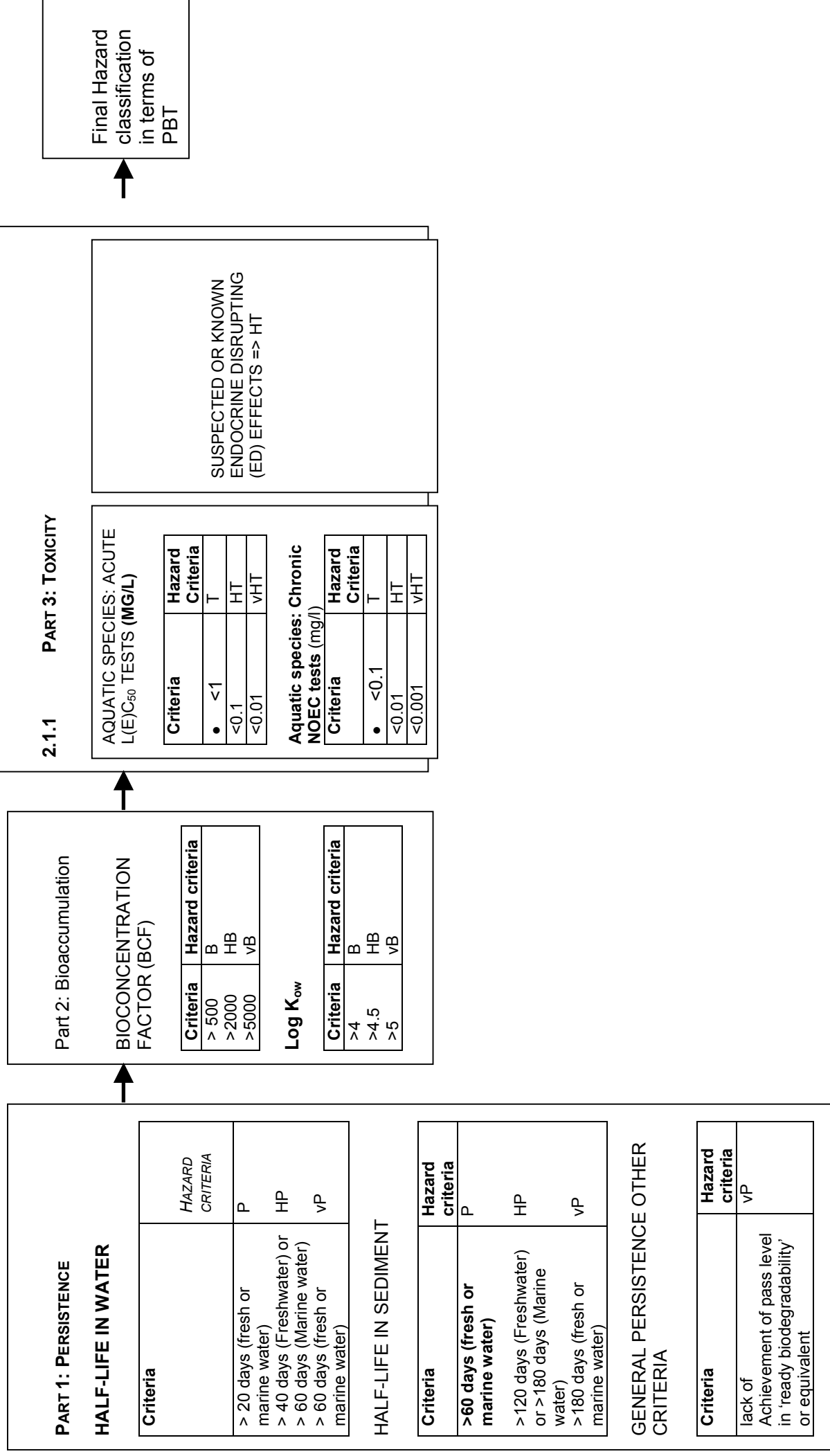## Final Hazard classification in terms of PBT

Hazard Assessment – Scoring in terms of PBT classification

Hazard criteria	HAZARD SCORE	Hazard criteria	HAZARD SCORE
Not classified	0	HP HB vHT	4
P	0	HP VB T	3
P B	0	HP VB HT	4
P HB	0	HP VB vHT	4
P vB	0	VP	0
P T	2	VP B	0
P HT	3	VP HB	0
P vHT	3	VP vB	4
P B T	3	VP T	2
P B HT	3	VP HT	3
P B vHT	3	VP vHT	3
P HB T	3	VP B T	3
P HB HT	3	VP B vHT	3
P HB vHT	3	VP HB T	3
P vB T	3	VP B vHT	3
P vB HT	3	VP HB T	3
P vB vHT	3	VP HB HT	4
HP	0	VP HB vHT	4
HP B	0	VP vB T	4
HP HB	0	VP vB HT	4
HP vB	0	VP vB vHT	4
HP T	2	B	0
HP HT	3	B T	2
HP vHT	3	B HT	3
HP B T	3	B vHT	3
HP B HT	3	HB	0
HP B vHT	3	HB T	2
HP HB T	3	HB HT	3
HP HB HT	3	HB vHT	3
HP HB HT	4	VB	0

HAZARD CRITERIA	HAZARD SCORE
VB T	2
VB HT	3
VB vHT	3
T	1
HT	2
VHT	3

Definitions and guidance for screening-prioritisation method

Exposure Assessment

Use

Annual use figure in UK (tons)

- Annual Use figure should be primarily based on nationally-accrued stats, for example pesticide use figures provided by DEFRA's Central Science Lab based on selected farm usage surveys. Where these are not available figures from industry or European use information, extrapolated for UK

- European figures can be used, assume standard proportion of 20% to represent emissions from England & Wales unless have other info to suggest more accurate proportion

Use pattern in UK

Controlled system - isolated intermediate, no direct release to the environment

Industrial, non-dispersive use – small number of releases to the environment – e.g. used at industrial or other identifiable sites resulting in controlled point source emission, local releases to the environment

Wide dispersive use – many mainly diffuse source releases to the environment

Used in the environment – batch releases within the environment

Monitoring

Detection = is defined as any concentration that exceeds 0.1ug/l in surface water and any concentration in groundwater. This is defined by the drinking water standard for pesticides which is applied to all substances for consistency since no single limit of detection can be set for all substances.

Nationally = >2 Regions

PNEC or EQS = Predicted No Effect Concentration (PNEC) and Environmental Quality Standard (EQS), environmental concentrations of a substance above which there are potential adverse effect

Refer to DEFRA database of Monitoring activities for chemicals in the environment which details monitoring activities in the UK by chemical and environmental compartment. Suitable sources of data should be quality-assured and preferably be part of national monitoring network or survey work

Monitoring data: detail

If a substance is monitored in UK get exact or approximate view on the following for each scheme/media:

1. If substance is detected (>0.1ug/l in surface water, any concentration >0 in groundwater)

2. Typical value ranges

3. Average monitored value

4. Environmental standard or PNEC - to illustrate concentration of a substance in the environment above which there is the potential for an adverse effect to organisms

5. Geographical spread of values

Hazard assessment

Screening data guidelines

The following methods are internationally agreed standard testing guidelines. Data from these tests should be used where possible. In principle, much data exist that may not have been produced from such testing. Where such data are not available, data generated from other acceptable methodologies may be used following expert judgement relating to its validity and relevance.

Preference should be given to peer-reviewed, quality-controlled sources of info and tests where recognised guidelines and/or GLP have been applied. Where more than one equivalent quality source is available expert judgement should be used to determine the best source of info.

Half-life in marine & fresh water, sediment & soil (days)

Any or all of the below if possible:

- OECD Standard test ref. 308: Aerobic and Anaerobic Transformation in Aquatic Sediment System

- OECD Standard test ref. 309: Water biodeg. Test and/or:

- Evaluation of the aerobic biodegradability of organic compounds at low concentrations - Part 1: Shake flask batch test with surface water or surface water/sediment suspensions. ISO/DIS 14952-1 (1999) Water quality

- OECD 307 Aerobic and Anaerobic Transformation in Soil

- See http://www.oecd.org/ehs/testguid/list.htm for more detail on these tests

Pass level in 'ready biodegradability' test

Any or all of the below if possible:

- OECD Standard test ref. 301: Ready Biodegradability through six methods described to screen chemicals for ready biodegradability in an aerobic aqueous medium: A: DOC Die-Away, B: CO2 Evolution (Modified Sturm Test), C: MITI (I)

(Ministry of International Trade and Industry, Japan), D: Closed Bottle, E: Modified OECD Screening, F: Manometric Respirometry

- OECD Standard test ref. 306: Biodegradability in Seawater
- See http://www.oecd.org/ehs/testguid/list.htm for more detail on these tests

Bioconcentration Factor (BCF)

– OECD Standard test ref. 305e: Bioconcentration: Flow-through Fish Test

– See http://www.oecd.org/ehs/testguid/list.htm for more detail on these tests

Log K_{ow}

Any or all of the below if possible:

– OECD Standard test ref. 117: Partition Coefficient (n-octanol/water), HPLC Method

– OECD Standard test ref. 107: Partition Coefficient (n-octanol/water): Shake Flask Method

– See http://www.oecd.org/ehs/testguid/list.htm for more detail on these tests

Aquatic species: Acute $L(E)C_{50}$ tests (mg/l)

Any or all of the below if possible:

- OECD Standard test ref. 201: Alga, Growth Inhibition Test
- OECD Standard test ref. 202: Daphnia sp. Acute Immobilisation Test
- OECD Standard test ref. 203: Fish, Acute Toxicity Test (pref. 96 hours LC50)
- See http://www.oecd.org/ehs/testguid/list.htm for more detail on these tests

Aquatic species: Chronic NOEC tests (mg/l)

Any or all of the below if possible:

- OECD Standard test ref. 210: Fish, Early-Life Stage Toxicity Test
- OECD Standard test ref. 211: *Daphnia magna* Reproduction Test
- OECD Standard test ref. 215: Fish, Juvenile Growth Test
- OECD Standard test ref. 212: Egg and Sac-fry
- See http://www.oecd.org/ehs/testguid/list.htm for more detail on these tests

Potential Endocrine disrupting effects

Any or all of the below if possible:

- Substances should be nominated for this category hierarchically by the following tests or lists mentioned hereafter:

In vitro tests

Yeast Oestrogen Screen (YES) Assay - to identify oestrogenic substances and indicate the relative concentration in E2 equivalents (ref. EDMAR report, sewage treatment effluents, various sponsors 2002)

Yeast Androgen Screen (YAS) Assay - to screen whether androgenic substances are present and indicate the relative concentration in DHT equivalents (ref. EDMAR report, various sponsors 2002)

MCF7 breastcancer cell lines and/or Chemically Activated Luciferase Expression (CALUX) - to identify oestrogenic substances

***In vivo* tests**

OECD approved non-spawning fish test (14-21d) using fathead minnow, medaka or zebrafish - to test for oestrogenic and androgenic activity both agonists and antagonists. This test is currently going to validation in a number of laboratories.

Test to be developed and validated in the future: spawning assay (42d). There is little doubt that this will go ahead after the non-spawning test validation is completed.

Alternatively the substance may be listed as category 1 or 2 EC list of priority substances for further evaluation. (Report ref. BKH M0355008/1786Q/10/11/00), see Annex 1.

Category 1 substances: At least one study providing evidence of endocrine disruption in an intact organism. Not a formal weight of evidence approach;

Category 2 substances: Potential for endocrine disruption. In vitro data indicating potential for endocrine disruption in intact organisms. Also includes effects in-vivo that may, or may not be ED-mediated. May include structural analyses and metabolic considerations.

Alternatively may be chemically similar to a substance with confirmed or suspected endocrine disrupting properties according to *in vivo* datasets

Insufficient info

In order for a substance to be screened there must be a minimum of 1 piece of info for persistence, bioaccumulation and toxicity and 1 piece of exposure assessment data (monitoring or use). Any substance that does not meet the minimum data requirements will be assigned a final ranking of 'insufficient information'

Guidance for verification and validation

Verification

This takes place once data has been collected and run through initial screen and make takes place because:
   a. screened rankings are not as expected based on expert judgement
   b. better sources of data become available

Preference should be given to peer-reviewed, quality-controlled sources of info and tests where recognised guidelines and/or GLP have been applied. Where more than one equivalent quality source is available expert judgement should be used to determine the best source of info.

It is recognised that PBT criteria may not be the most appropriate way in which to assess prioritisation with respect to the water column and therefore a verification stage

which aims to corroborate the appropriateness of the resultant prioritisation with respect to the water column has been introduced into the methodology.

This verification stage incorporates the use of a fugacity model (EQC model, University of Trent) the aim of which is to substantiate that the most likely 'sink' of any particular chemical, and therefore the media in which is should be controlled, is water. Where this is found NOT to be the case (for example sediments are found to be the most likely sink for the chemical of concern) an appropriate policy decision on the way forward (i.e. continued inclusion in priority ranking system) needs to be made.

Validation

Validation should be carried out following ranking to interpret the findings and should include:

- How the ranking was achieved – breakdown of scoring and data/sources

- Expert description of the potential threat including potential threat to other media

- Confidence/uncertainty in the data & sources used, e.g. only 1 piece of T data

- Recommendation on how to proceed, e.g. should take action or more info needed

Appendix 4: Summary of results from the prioritisation exercise

The results of the prioritisation exercise are summarised in the table below. The exposure and hazard ranking for each of the chemicals considered is shown along with the overall priority ranking assigned.   A brief summary of the available data is shown in the Comments column and for those chemicals that have been peer reviewed as part of this exercise a summary of the outcomes are provided in the column title 'Review Comments'.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
1-(5,6,7,8-Tetrahydro-3,5,5,6,8,8-hexamethyl-2-naphthyl)ethan-1-one	1506-02-1	2	3	2	**Exposure** - fragrance used in personal care and household cleaning products. Tonnage of 72t estimated from EU usage. Gives a use score of 2. No monit data available. Overall exposure score of 2. (CSF compound but removed from list in July 06 as does not meet PBT criteria but awaiting deg study results) **Hazard** - no sediment or water persistence data located. Noted as being not ready biodeg ie vP. Estimated half lives used in HERA risk assessment indicated vP for water (150d) and sediment (180d). Log Kow suggest vB (although BCF do not support this). Acute and chronic tox suggest T. Hazard classif as vP, vB and T which gives a score of 4 (*however see review notes*).	- A risk assessment has been undertaken by HERA and is underway under ESR. The HERA assessment did not indicate a risk to the environment. No Agency monitoring data however European data quoted in HERA note levels around 0.02 – 0.47ug/l with most being at the lower end. Data for UK was noted - this was limited to a study in Yorkshire which showed levels of 0.002- 0.024ug/l and in STW effluence of 0.46 – 2.7ug/l. Environmental concns and effluent concs all below the PNEC derived in the HERA assessment. Tonnage used is noted to be falling – halved between 1992 and 2000. - Found to be of relatively low tox with a classification of T, the BCF and log Kow values differed – initial classification based on log Kow as a worst case however BCF does not support this ie actual data does not support estimate from log kow. Suggest use of BCF rather than the log Kow. This would give a classif of B which gave an overall hazard score of 3. Persistence data was limited. - Based on reducing tonnage, monitoring data suggesting below PNEC propose not to put forward for EQS develop at this stage but to keep a watching brief especially the ESR review outcome Not currently a priority for EQS development
1,1,1-Tetrachloro-2,2-bis(4-chlorophenyl)ethane (tetrachloro DDT)	3563-45-9	Insufficient info	Insufficient info	Insufficient info	**Exposure** - no data found on use or tonnage. No monit data. Overall exposure score 'Insufficient info'. **Hazard** - no persistence data located. No BCF but log Kow indicates vB. No tox data although classif of HT as listed as potential endocrine disrupter. Due to lack of persistence data however overall score is 'Insufficient info'	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
1,1,2,3,3-pentamethylindan	1203-17-4	Insufficient info	Insufficient info	Insufficient info	**Exposure** - included on CSF list of concern however has now been removed due to not meeting HPV criterion as used primarily as an intermediate and not in dispersive use. Appears under category of Fragrances and is an intermediate in the prodn of HHCB (polycyclic musk). No info on use tonnage. No monitoring data. Overal exposure score 'Insufficient info' **Hazard** - no data available therefore classification of 'Insufficient info'	
1,1,2-trichlorotrifluoroethane	76-13-1	Insuff info	0	Insufficient info	**Exposure** - Is a CFC. Used as a solvent and refrigerant; It is used in fire extinguishers and as a blowing agent. It has a range of cleaning applications and vapor degreasing. Subject to significant controls due to ozone depletion effects - production ceased. Emissions from existing uses however. No monit data available. Insufficient data for scoring. **Hazard** - Very volatile therefore volatilisation key removal process - order of hours. Not thought to biodegrade but no half lives available. Not readily biodegradable (vP). Log Kow and BCF data don't indicate classification under bioacc. Limited toxicity data indicate not classified under toxicity. Overall hazard vP - 0	
1,1-dichloroethane	75-34-3	1	0	5	**Exposure** - Limited data - thought to be used as a chemical intermediate. No tonnage data. Monit data avaiable - mainly for GW. Analysed for in 5 Regions, 6+ve samples from 658. Detected above threshold in 2 Regions - gives a score of 1. Overall exposure score of 1 based on monit data. **Hazard** - very limited data. Only volatilisation and hydrolysis half lives available for persistence data. Hydrolysis suggests vP but volatilisation no classification. Log Kow and BCF data suggest no classification. Tox data suggests no classification. Although limited data if use worst	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					case as vP gives a score of 0	
1,1-dichloroethene	75-35-4	4	0	5	*Exposure* - it is primarily used as a chemical intermediate. Used in the production of polymers for use, for example in food packaging, textile coatings and on outdoor furniture. Also use in production of HCFCs and 1,1-trichloroethane. Tonnage data is old with a worldwide estimate of tonnage produced in 1980s being approx 300000tonnes. Indicates a use score of 4. Monit data available - mainly for GW, 1067 samples across 5 Regions. 52+ve detects. Above threshold in 2 Regions (exposure score of 1), exceedance of CICAD PNEC in 2 Regions giving exposure score of 3. Overall exposure score of 4 based on use. *Hazard* - persistence data indicated volatilisation key process with half lives indicating not classified however not thought to be readily biodeg (vP). Log Kow and BCF data indicate not classified under bioaccumulation. Toxicity data indicate not classified under toxicity. Overall hazard classification of vP which indicates a hazard score of 0.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
1,2,3,7,8-pentachlorodibenzodioxin	40321-76-4	Insufficient info	4	Insufficient info	**Exposure** - dioxins are not commercially produced – they arise as by-products from combustion, certain chemical processes. No use tonnage data therefore. Monitoring data shows 6 samples (3+ve detects), all in NE region but only for trade therefore no FW or GW samples. Overall exposure score is 'Insufficient info'. **Hazard** - volatilisation half lives reported in order of 21-236d increasing to 52 years as adsorbed readily which limits volatilisation. Adsorb strongly to sediment - studies show persistence in sediment with half lives greater than 2 years. Indicates vP. BCF indicates B, Log Kow indicates vB. Limited tox data which indicates vHT. ED data indicates HT. Overall hazard classification based on limited data is vP, vB and vHT which gives a hazard score of 4.	
1,2,4,5-tetrachlorobenzene	95-94-3	Insufficient info	3	Insufficient info	**Exposure** - No tonnage data available. Data on use indicated used as intermediate eg in manuf of pesticides and other chlorinated organics eg 2,4,5-TCP. Also may be present as a deg by-product of pentachlorobenzene and hexachlorobenzene. Monitoring data indicates not detected. Insufficient data to give exposure score. **Hazard** - limited data set. Only volatilisation and photolysis half lives for water. Volatilisation data indicates P. Sediment data indicates not classifiable. Data suggests slow biodeg but no clear studies provided. BCF and log Kow data suggest HB. Acute data suggests T. Overall is P, HB and T which gives a score of 3 (although based on limited data)	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
1,2,5,6,9,10-hexabromocyclododecane	3194-55-6				See hexabromocyclododecane	
1,2-dibromoethane	106-93-4	0	0	5	*Exposure* - no data on current usage. Has previously been used as a fumigant however use in EU banned in 1988. Other potential uses noted include as a scavenger for lead antiknock agents in petrol, as a solvent and chemical intermediate - however no indication of scale of such uses or quantities. Monit data - 61 samples mainly in NE Region and of ground and surface water. No +ve detects (all <LOD - 0.2-5ug/l). Monit score of 0. Overall exposure score of 0 based on monitoring. *Hazard* - limited data available. Half life data in water indicates P-vP. BCF and log Kow data indicate not classifiable under bioaccumulation. Tox and ED data suggest not classifiable under toxicity. Overall hazard classification of vP gives a score of 0.	
1,2-dichlorobenzene	95-50-1	4	4	1	*Exposure* - it is primarily used as a chemical intermediate and solvent. Western Europe tonnage prodn in 1999 was 54000t - gives a use score of 4 (NB. prodn tonnage rather than use tonnage). Monit data indicates 16+ve detects in 1280 samples of GW and SW in 2 Regions. Detected above threshold in 1 Region in both GW and SW, giving a monit score of 1. Overall exposure score of 4 based on tonnage. *Hazard* - water half life data available for volatilisation and photolysis - volatilisation suggests HP. Thought to adsorb to seds but no half lives. Not thought to be readily biodeg (although is where orgs acclimated) - vP. Log Kow does not suggest classification but BCF suggest vB. Acute tox data indicate T. Overall hazard score of vP, vB and T - 4	- Need to investigate further what this chemical is used for the in the UK and the quantities used before a final decision on whether an EQS is required is made. Data for one Region only – need to identify source and whether a local issue. Need to check in North East Region whether it is used on Teeside. Under review

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
1,2-dichloroethene	540-59-0	2	0	5	*Exposure* - used as a solvent eg for waxes, resins and pharmaceuticals. Used as a chemical intermediate, eg in the manufacture of pharmaceuticals. Also used as a coolant. No data on tonnage used. Monit data indicates that approx 65 samples showed positive detections from 1500 samples. Monitored in GW in 8 Regions and in SW in 3 Regions. Above thresholds in 4 Regions and gives a score of 2. Overall exposure score of 2 based on monit data. *Hazard* - limited data available. Half life data available for volatilisation which suggests not classifiable under persistence - however ready biodeg data suggests vP. BCF and log Kow data indicate not classifiable under bioaccumulation. Limited acute tox data indicate not classifiable. Overall hazard classification of vP giving a score of 0.	
1,2-dichloropropane	78-87-5	4	0	5	*Exposure* - used as a solvent. IUCLID indicates potential high tonnage but limited data. Suggests use score of 4. Monit data notes 19 samples across 2 Regions but no detections above LOD (0.2ug/l for surface water samples in NE and in range of 1-5ug/l for waste sites in Anglian). Based on usage data indicate score of 4 for exposure. *Hazard* - limited data. Half lives for volatilisation and hydrolysis available. Suggests vP as not readily biodegradable. BCF and log Kow data do not suggest classification. Acute tox data indicates no classification under toxicity. Overall hazard classif of vP which gives a score of 0.	
1,3-dichlorobenzene	541-73-1	2	0	5	*Exposure* - limited data on use - noted to be a chemical intermediate. Some reference to it being a fumigant but no data to support this. No tonnage data available. Monit data shows 8+ve results out of 1234 - SW in 3 Regions and GW in 2 Regions. Detected in 2 Regions above threshold - gives a score of 2 for monit. Overall exposure score of 2 based on monit data.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - limited data available. Water half lives only available for volatilisation – suggest not classifiable. Ready biodeg tests suggest vP. BCF and log Kow data suggest not classifiable. Tox data indicate not classifiable. Overall hazard classification of vP which gives a score of 0	
1,3-dichloropropan-2-ol	96-23-1	Insufficient info	0	Insufficient info	*Exposure* - limited data indicates is used as a chemical intermediate. No tonnage data available. No monit data available. Insufficient data to propose an exposure score.

Hazard - Limited data available. Data (volat, hydrolysis) indicates vP - variable ready biodeg data - some suggests not biodeg.. Log Kow and BCF data do not suggest classification as bioaccumulative. Limited acute data suggest no classification under toxicity. Overall hazard classification of vP giving a score of 0 | |
| 1,3-dichloropropene | 542-75-6 | 4 | 1 | 3 | *Exposure* - used in chemical synthesis but also used as a nematicide. Approved for use in UK on a variety of crops mainly fruit. To be reviewed under PPPD. Data on tonnage indicates score of 4. Monit data is limited (61 samples all in NW and Ang but no +ve detects as all below LOD). Overall exposure score of 4 based on use.

Hazard - persistence data indicatesnot classified.
BCF and log Kow suggest no classif. Acute tox data suggests T. Overall hazard score of T which gives 1 (See review notes) | - Further data arising after review indicates that 1,3-dichloropropene is not persistent in the environment. Original daes suggest vPwhich gave a hazard score of 2 which resulted in an overall score of 2. This would give a hazard score of 1 which would result in an overall priority ranking of 3.
- The substance is subject to review under PPD at the moment. The draft report indicates that further data is required on predicted environmental concentrations arising from application to soil before an assessment can be made
- Due to the lower hazard assessment and the ongoing risk assessment it is proposed that at this stage it is not taken forward for EQS development but that reviewed as further data becomes available.

Under review |

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
1,4-dichlorobenzene	106-46-7	4	2	2	**Exposure** - mainly used as a chemical intermediate, eg in production of precursors for dye. Also used as a moth repellant, air freshner and toilet block. Tonnage estimated to be high (although data from mid 90s). Gives a use score of 4. Monit data shows approx 1300 samples of which 27+ve detects. Monitored in three Regions but many trade discharges. Score of 1 as detected above threshold in 2 Regions. Overall exposure score of 4 based on use. **Hazard** - limited persistence data - does not suggest classif as P. Log Kow does not suggest classif as B but a few BCFs indicate B. Acute tox data indicates T. Overall hazard score of B and T which gives 2.	- The available data indicate a high exposure score based on use. The monitoring data available for UK waters suggests levels below the proposed ESR PNEC. - However the ESR risk assessment notes that usage shows limited exposure in the environment. Surface water monit data reported for a range of countries shows low ug/l detected. ESR indicated no risk identified and no further data required. Based on this propose 1,4-dichlorobenzene is not proposed for EQS development at this stage as risk not identified from EU risk assessment. Not currently a priority for EQS development
17α-ethinyloestradiol	57-63-6	3	3	2	**Exposure** – Synthetic hormone. Available tonnage data indicates a tonnage score of 0. Monitoring data indicates is detected and AA exceeded in 1 Region - 3 - but based on few data and many of samples relate to STW. LOD is close to PNEC **Hazard** – the available hazard data indicates HP, B and vHT (chronic) - 3.	- Low tonnage. The limited monit data available indicates presence in STW effluents and the environment - Hazard data suggests it is of potential concern and research suggests it is having adverse effects in the environment due to endocrine disrupting properties. - Detection in the environment, potential hazard and concern re: adverse effects occurring in the environment result in a proposal for EQS development Priority for EQS development
17β-Oestradiol	50-28-2	3	3	2	**Exposure** – Natural steriod oestrogen. No tonnage data. Available monit data indicates presence in env and STW effluent. **Hazard** - the available hazard data indicate a hazard classification of - P, B and HT – 3. It is an ED substance	- No tonnage data. The limited monit data available indicates presence in STW effluents and the environment - Hazard data suggests it is of potential concern and research suggests it is having adverse effects in the environment due to endocrine disrupting properties. - Detection in the environment, potential hazard and concern re: adverse effects occurring in the environment result in a proposal for EQS development Priority for EQS development

Prioritising chemicals for standard derivation under Annex VIII of the Water Framework Directive

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
1-chloro-2,4-dinitrobenzene	97-00-7	1	2	4	**Exposure** - no use data. Monit data - very limited, just for surface water in one region - 1 **Hazard** - limited data indicates vP and T - 2	
1-chloro-2-nitrobenzene	88-73-3	4	0	5	**Exposure** - use score of 4. Monit data - detected in 1 Region, no exceedance of SIDS PNEC - 1. Use drives exposure score. **Hazard** - data indicates hazard score of 0 (vP)	
1-chloro-3-nitrobenzene	121-73-3	1	2	4	**Exposure** - no use data. Monit data very limited - mainly discharges - 1 receiving water data point above detection limit gives a score of 1 but based on limited data **Hazard** - data indicates vP and T – 2.	
1-chloro-4-nitrobenzene	100-00-5	4	0	5	**Exposure** - use score of 4. Monit data but only two pieces of data used to get score of 3 - ie LT PNEC exceeded in 1 Region, but use data has higher score anyway. **Hazard** - available data indicates vP - 0	
1-chloronaphthalene	90-13-1	Insufficient info	3	Insufficient info	**Exposure** - no use or monit data. **Hazard** - limited data - suggests P,B,T - 3	
2,2',6,6'-Tetra-tert-butyl-4,4'-methylenediphenol	118-82-1	Insufficient info	4	Insufficient info	**Exposure** - listed on CSF list. No info on use located. No data on monit. Overall exposure score of 'Insufficient info' **Hazard** - limited data set. Only persistence data related to readily biodegradability - not thought to be readily biodegradable (vP). BCF and log Kow indicate vB. Limited tox data (only acute) does not indicate classification. Overall hazard classif of vB and vP - gives a hazard score of 4.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
2,3,4,7,8-pentachlorodibenzofuran	57117-31-4	Insufficient info	4	Insufficient info	*Exposure* - furans are not commercially produced - arise as by-products from combustion & certain chemical processes. No use tonnage data therefore. Monitoring data shows 6 samples (4+ve detects), all in NE region but only for trade therefore no FW or GW samples. Overall exposure score is 'Insufficient info' *Hazard* - not thought to hydrolyse, volatilisation half lives up to 106 days and longer if attenuated by adsorp to sed. Data on sediment half lives indicates vP. BCF and log Kow indicate vB. Limited tox data but indicates vHT (chronic data). ED data suggests HT. Overall hazard classification vP, vB and vHT - 4	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	Insufficient info	4	Insufficient info	*Exposure* - by product therefore no specific use tonnage data (could maybe use emissions data eg PI). Limited monit data (6 samples in trade effluent in NE, 5+ve samples but none above the reporting threshold). Although some monit data give overall exposure score of 'Insuff info' as not surface water samples. *Hazard* - data indicates vP (based on water half life and ready biodeg data),vB (based on log Kow) and vHT (based on acute and chronic data - ED indicates HT). Overall hazard classifcation of vP, vB and vHT gives overall hazard score of 4	
2,3-dichloropropene	78-88-6	Insufficient info	0	Insufficient info	*Exposure* - no information was available on the use of this chemical and no monit data was available. Therefore 'Insufficient data' to propose an exposure score. *Hazard* - very limited data. Biodeg was not thought to be a key process but no data available. Hydrolysis half life indicates P - volatilisation thought to be a key process. BCF data suggests no classification under	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					bioaccumulation - no Kow data. Limited tox data indicates no classification. Overall hazard classification of P which gives a score of 0	
2,3-dihydrobeta,1,1,2,3,3-hexamethylindan-5-ethanol	1217-08-9	Insufficient info	Insufficient info	Insufficient info	*Exposure* - no usage or monitoring data available. Is an intermediate in the production of HHCB which is a fragrance used in perfumes etc. Has been removed from CSF list due to fact that falls below HPV tonnage threshold of 1000t and low or no dispersive uses as primarily used as an intermediate. Overall exposure score of 'Insufficient info' as no use or monit data. *Hazard* - no available experimental data. QSAR data given in a Norwegion report indicates vP, vB and HT however as all predicted values not used. Overall hazard score of 'Insufficient info'	
2,4,5-T (including 2,4,5-T salts and 2,4,5-esters)	93-76-5	2	Insufficient info	Insufficient info	*Exposure* - use data available. Herbicide (component of Agent Orange). No currently approved products in the UK. Not supported under PPPD. Most recent usage stats from CSL was for 2001 - showed 0.072t. No data suggesting other uses. Low usage results in score of 1 (although current usage could be lower). Monitoring data avail - detected in GW and SW to give a score of 2. Therefore overall exposure score of 2 driven by monit data. *Hazard* - limited data located. Insufficient persistence data available. Bioaccumulation data suggest no classif. One of tox datapoints suggests T. Overall hazard score of 'Insufficient info' due to lack of sufficient persistence data	
2,4,6-tri-*tert*-butylphenol	732-26-3	1	4	3	*Exposure* - OSPAR review document notes that approx 10tonnes is reported to be used in the EU. It is noted there is some uncertainty over its use pattern however uses are thought to include:- chemical intermediate for the production of antioxidants used in rubbers and plastics. May be present in lubricant antioxidant products although unclear whether	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					unintentionally as an impurity. May be an additive for gas and fuel oil distillate. Info suggests score of 1. No monitoring data was available. *Hazard* - limited data set. Available half life and ready biodeg data indicate vP, BCFs and log Kow indicate vB, acute toxicity data indicates HT. Overall hazard classification is vP, vB and HT - 4	
2,4-dichlorophenoxybutyric acid (2,4-DB)	94-82-6	2	0	5	*Exposure* - herbicide approved for use in a number of products on a range of crops, mainly cereals, grassland, clover. Included on Annex 1 of PPPD. Tonnage used in ag in 2004 was 60t - gives a score of 2. Monit data mainly for NE Region. 174 +ves from 1819, no EQS, detected in 1 Region - therefore score of 1. Overall exposure score 2 based on usage. *Hazard* - Data available suggests no classification under P. Log Kow and BCF data suggest no classification under B. Toxicty data suggest no classification under T. Hazard score of 0	
2,4-di-tert-butylphenol	96-76-4	3	2	2	*Exposure* – is one of the substances reviewed in the EA Risk assessment on alkyl phenols. It is primarily used as a chemical intermediate. Over 1000t are estimated to be produced in the EU however it is not currently thought to be widely used as an intermediate in the EU – although it may be in products imported into the EU. No monit data is available. An exposure score could be derived based on prodn data which would suggest a score of 3. However this may overestimate exposure as although produced it is not thought to be widely used in the EU *Hazard* - very limited data. Not thought to hydrolyse and no photolysis data. Not readily biodegradable. As with other alkyl phenols thought to undergo oxidation – relatively rapid in freshwater but much slower in saltwater. Using saltwater data and the ready biodeg info	- The exposure score was based on production in the EU however the risk assessment noted that it is not widely used in the EU as an intermediate although may be present in imported products. This suggests lower potential to reach the environment. No monit data to support indication of presence. - Hazard score is based on persistence and toxicity – some uncertainty over persistence data. - As relatively low hazard and uncertainty over exposure suggest not put forward for EQS development at this stage but reviewed as new data becomes available. Under review

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					suggests vP. Log Kow suggests vB although not supported by BCF which suggests no classification. Toxicity data only available for 2 fish species - suggests T. Overall hazard classification of vP and T which gives a score of 2	
2,6,6-Trimethylbicyclo[3.1.1]heptane	473-55-2	Insufficient info	3	Insufficient info	**Exposure** - fragrance. Removed from CSF list in July 06 as did not meet PBT criteria. No tonnage data available. No monit data. Overall exposure score of 'Insufficient info'. **Hazard** - very limited data set. Persistence data for water limited and only related to volatilisation - indicated no classif (no sed or ready biodeg data). log Kow data indicated a classification of B. Limited tox data - acute data suggest no classif but chronic tox data suggest vHT. Hazard classif of B,vHT gives score of 3	
2,6-di-tert-butyl-p-cresol [butylated hydroxytoluene (BHT)]	128-37-0	4	4	1	**Exposure** - Production in Western Europe (2000) noted as 25000t/a with world prodn being 62000t/a. Used as an antioxidant in a wide range of situations eg gasolines, lubricating, turbine oils, waxes, rubber, paints, plastics as well as foods, cosmetics and food packaging. Use score of 4. Is on CSF list of concern. No monitoring data available. Current exposure score is 4 based on use data. **Hazard** - very limited data - ready biodeg only for persistence and suggest vP, BCF and log Kow data suggest HB and vB respectively. Chronic tox data suggests T. Hazard score therefore vP and vB and T which indicates 4 (however see review notes).	- The EA risk assessment on alkyl phenols was considered as a result of the peer review. This provided additional data on the use and hazard of BHT. - From its use as an antioxidant (mainly as a stabiliser in rubber (50%), oils, lubricants and fuels (25%) and plastics (10%)) it may enter the environment during use but also from the actual products eg volatilisation from plastics and rubbers, entry from disposed fuel/lubricants, run-off etc. No additional guidance however was provided on tonnages used and no monit data was noted - In terms of hazard the persistence data was supplemented – supported idea that not readily biodeg however indicated that reaction with photochemically generated oxidants is a key loss process – half life about 13days in freshwater but longer in saltwater. Therefore suggests lower persistence in some situations – although dependent on sunlight etc., therefore

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						use vP as a precaution. BCF noted in range of 230-2500 with a value of 1276 chosen – use of this value and use of BCF rather than log Kow give classif of B. Toxicity data supports T. Overall hazard classif of 3 using vP, B and T rather than 4. This still gives an overall score of 1. - The risk assessment suggests some potential for risks near processing sites. However need to consider whether an issue in UK - However question still over whether present in the environment – need to address and consider – no monitoring data is currently available. - Propose to put on hold for EQS development until further data can be obtained on exposure Under review
2,6-di-tert-butylphenol	128-39-2	2	3	2	*Exposure* - Used as an intermediate in the synthesis of other substances, eg phenolic oxidants. Also used as an oxidation inhibitor and stabiliser mainly for fuel oil and gasoline. Prodn noted as 5000t/yr in 1991 (assumed to be world wide). If take 10% of this is 500 t and times 0.2 gives 100t which gives a score of 2. No monitoring data available. Overall exposure score of 2. It is one of the substances reviewed in the Agency RA on alkyl phenols. *Hazard* - Limited fate data. Hydrolysis in the order of 17-130days, photodegradation thought to be more imp than biodegradation but no half lives given. Not thought to be ready biodegradable - vP. Log Kow suggests HB, BCF data suggests B. Acute and chronic tox data suggest T. Hazard classification potentially vP, HB and T which is 3. (see review notes however)	- Data collated for the EA risk assessment note mainly used as a chemical intermediate with remainder used as an antioxidant in fuel. RA indicate potential risk arising from production and use as an intermediate. Need to get a better understanding of use in UK – eg is it produced/used. No monitoring data available – data reported in RA for other countries note low concentrations detected in range of 0.043 – 0.053ug/l in surface waters in Germany and 0.06ug/l in US with a max of 0.11ug/l. These levels are below the PNEC of 5.3ug/l. - Limited hazard data – question over persistence as although not readily biodeg as an antioxidant may react rapidly with oxidants present in the water. Propose use classif of B rather than HB for bioaccumulation as indicated by the BCF data. Does not affect overall hazard score however. - Propose not put forward at this stage – but review as further data becomes available, particularly in relation to potential exposure in the environment.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						Under review
2-amino-4-chlorophenol	95-85-2	Insufficient info	Insufficient info	Insufficient info	*Exposure* - no use or monit data. *Hazard* - no persistence or toxicity data	
2-chloroaniline	95-51-2	1	0	5	*Exposure* - no use data. Monit data - detected in 1 Region - 1. *Hazard* - data indicates HP - 0	
2-chloroethanol	107-07-3	Insufficient info	0	Insufficient info	*Exposure* - no use or monit data. *Hazard* - limited persistence data, possibly vP - no other hazard classif - 0	
2-chloro-p-toluidine	615-65-6	Insufficient info	Insufficient info	Insufficient info	*Exposure* - no use or monit data. *Hazard* - very limited data, no persistence or bioaccumulation data.	
2-chlorotoluene	95-49-8	Insufficient info	1	Insufficient info	*Exposure* - no tonnage data. No monit data. *Hazard* - data indicates T - 1	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
2-Phenoxyethanol	122-99-6	Insufficient info	0	Insufficient info	*Exposure* - no use or monit data. *Hazard* - limited data avail - suggests no classif	
3,4-dichloro-alpha,alpha,alpha-trifluorotoluene	328-84-7	Insufficient info	3	Insufficient info	*Exposure* - no use or monitoring data. On list of CSF substances. Overall exposure score 'Insufficient info' *Hazard* - very limited data available. No biodeg data - volatilisation occurs (4.3hrs to 5.8d) but attenuated by adsorption (53d) - suggests score of HP - ready biodeg data suggests vP. BCF and log Kow data suggest B. Acute and chronic data suggests T . Overall hazard score vP, B and T ie 3	
3,4-dichloroaniline	95-76-1	4	3	1	*Exposure* - In W. Europe 12000t produced in 1991. No prodn in UK. In 1996-98 prodn volume 13500-15500t/a - used exclusively as an intermediate for synthesis of herbicides (in particular diuron, propanil and linuron), azo dyes and isocyanates. Also a breakdown product of several herbicides. Gives a use score of 4. Monitoring data is limited - only 5 samples from NE Region but all positive detects. Gives monit score of 1. (Conc detected in range of 1.4-3.9ug/l) Overall exposure score is 4 based on use data. *Hazard* - persistence data notes photolysis is main route of deg - stable to hydrolysis and limited biodeg. Based on photolysis is not classified as P. Half life for sediment estimated in TGD as 1000d due to lack of data. Not readily biodegradable therefore vP. BCF suggests B but log Kow does not suggest classification under bioaccumulation. Acute tox data indicate T and chronic data HT. Some concs detected were in similar range to the lower reported effect concentrations. ED notes HT also. Overall hazard classification therefore vP,B and HT which gives a score of 3.	- Already included for EQS development in Tranche 3. - A risk reduction strategy has been drawn up for 3,4-dichloroaniline under ESR as the risk assessment identified risks due to emissions during production and production of propanil, the use of TCC as bactericide in household products such as cosmetics and deodorants and increased surface water pollution due to emissions of the precursor diuron. Therefore key sources are the precursors TCC and diuron. Extent of use of TCC in UK unclear. Diuron was widely used however since then has been reviewed under PPPD and decision taken to not include on Annex 1 therefore use will be phased out. Some uses as non-ag eg in biocidal paints and wood preservative - will be reviewed under BPD. Use for thoses purposes is more limited than for thoses uses covered under PSD approval. In addition diuron is Annex X and therefore will be controlled via an EU EQS. These controls may reduce potential for 3,4-dichloroaniline exposure in the environment.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
3-chloroaniline	108-42-9	Insufficient info	2	Insufficient info	*Exposure* - no use or monit data. *Hazard* - T, vP - 2	
3-chlorophenol	108-43-0	4	0	5	*Exposure* - use data - 4 (based on total chlorophenol prodn). Monit data shows detection in 3 Regions but no EQS exceedance - 2. *Hazard* - persistence data suggests vP - 0	
3-chloropropene	107-05-1	Insufficient info	0	Insufficient info	*Exposure* - no use or monit data. *Hazard* - data available indicates vP - 0	
3-chlorotoluene	108-41-8	Insufficient info	Insufficient info	Insufficient info	*Exposure* - no use data and no monit data. *Hazard* - no persistence data.	
3-methylphenol (m-cresol)	108-39-4	3	0	5	*Exposure* – Limited tonnage data – estimate of W. Europe prodn suggests a score of 3. Monit data available indicates approx 28000 samples, both surface and groundwater across the majority of Regions. Approx 1500+ve detects (5%). Most samples showed concs below the LOD of 0.02-0.5ug/l. Although some high effluent and waste concentrations the environmental samples were generally lower than the EQS – a few samples in North West indicated exceedances of the EQS. Gives a monit score of 3 *Hazard* - is HP. Doesn't meet tox or bioaccumulation criteria and therefore gives overall hazard score of 0	- Limited data available on use but monitoring data indicates detection and EQS exceedance. In response to review considered monit data in more detail. A large number of samples have been analysed for m-cresol but only a few detects and only a handful above the Annual Average – but not a true comparison with the one off sample results - Hazard score is low based on available data. - As limited detection in the environment and mainly below the EQS and as it has a low hazard score propose that it is not considered as a priority for EQS development at the moment . Not currently a priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
4-(2,4-dichlorophenoxy)aniline	14861-17-7	Insufficient info	1	Insufficient info	**Exposure** - no use or monitoring data available. Is on the CSF list and data is apparently being collated. Current exposure score is 'Insufficient info'. **Hazard** - very limited data available. Only persistence data is for ready biodeg - doesn't indicate classification. Log Kow available but doesn't indicate classification. Acute toxicity data indicates classification as T - no chronic or ED data. Hazard classif therefore T which gives a score of 1 (but based on limited data).	
4-(dimethylbutylamino)diphenylamin (6PPD)	793-24-8	4	3	1	**Exposure** - used as a rubber antidegradant. Most used in tyres. Tonnage indicates use score of 4 (based on estimated worldwide tonnage). No UK data on usage. No monit data. Overall exposure score of 4 based on use. **Hazard** - persistence data shows ready biodegradability (altho variable data) and rapid degradation in water (hydrolysis is key). (Removed from CSF priority list as rapidly breaks down). Half-life in water may give a classif of P. BCF does not indicate classification but Log Kow suggests HB. Acute tox data mainly suggests T although one study suggests HT. Overall hazard classif of P, HB and HT which gives a score of 3	- Exposure needs to be considered further before a final decision is taken on whether to consider for EQS development. No UK data on usage. Need to take further steps to identify tonnage and also consider use of modelling to assess potential to reach the environment. Following this need to consider the possbility of undertaking monitoring eg through inclusion in TRBM exercise. - Further info on hazard would also be useful. The worst case data was used to determine the hazard classification. As noted 6PPD was removed from the CSF priority list as it was found to degrade rapidly therefore may not by vP. This may also influence potential to bioaccumulate as may not remain in the environment for long periods. Log Kow suggested HB but BCF did not indicate classification with respect to bioaccumulation which may reflect fact bioaccumulation may not occur. This may result in hazard classification not being HB. However does not affect the overall hazard classif, ie still a 3. Worst case toxicity data was also considered. Need to review as further hazard data becomes available. - Therefore further data on exposure needs to be obtained along with further consideration of the hazard data.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						Under review
4,4'-methylenedianiline (MDA)	101-77-9	4	0	5	*Exposure* - primarily used as an intermediate but also as a hardner for resins and adhesives for example. High tonnage based on 20% of W. Europe use. Gives use score of 4. Limited monitoring data - 50 samples over 5 Regions but all 'less thans'. Gives a score of 0. Overall exposure score of 4 based on usage. *Hazard* - not readily biodeg therefore vP. Persistence in water and sediment predicted to be high in TGD and also indicate vP. BCF and logKow do not indicate classification. Acute and chronic data do not suggest classification. Overall hazard classification of vP - 0	
4,6-di-tert-butyl-m-cresol	497-39-2	Insufficient info	4	Insufficient info	*Exposure* - no use or monitoring data available. HSDB indicates it is a chemical intermediate for the prodn of phenolic resins and synthetic musks. It is on the CSF list of concern and is one of the substances considered in the EA's risk assessment on 'hindered alkyl phenols'. It is also on OSPAR list of substances of concern. There is no tonnage data available or monit data therefore has an exposure score of 'Insufficient info'. RA notes only produced at one site in EU and is used at this site as an intermediate – potentially limited exposure to environment therefore unless impurity in products or chemicals degrade to form it *Hazard* - very limited data. Only ready biodeg data which indicates vP. BCF and log Kow indicate HB and vB respectively. Limited tox data but indicates no classification. Hazard score therefore vP and vB which is 4.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
4-chloro-2-nitroaniline	89-63-4	Insufficient info	Insufficient info	Insufficient info	*Exposure* - no use or monit data. *Hazard* - no persistence data	
4-chloro-2-nitrotoluene	89-59-8	1	Insufficient info	Insufficient info	*Exposure* - no use data. Monit data – detected in 2 Regions - 1. *Hazard* - no persistence data. Toxicity suggests T	
4-chloro-3-nitroaniline	635-22-3	Insufficient info	Insufficient info	Insufficient info	*Exposure* - no use or monit data. *Hazard* - no persistence or toxicity data	
4-chloroaniline	106-47-8	Insufficient info	2	Insufficient info	*Exposure* - no use or monit data. *Hazard* - vP and T - 2	
4-chlorophenol	106-48-9	4	0	5	*Exposure* - use score of 4 (based on total chlorophenol prodn). Monit data- detected in GW and SW but no EQS exceedances – gives a monit score of 2. *Hazard* - indicates vP - 0	
4-chlorotoluene	106-43-4	1	0	5	*Exposure* - no use data. Monit data shows detected in 1 Region - 1. *Hazard* - data indicates vP - 0	

Prioritising chemicals for standard derivation under Annex VIII of the Water Framework Directive

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
4-nitrotoluene	99-99-0	4	0	5	*Exposure* - used mainly as an intermediate in the production of a range of chemicals eg optical brighteners and pharms. Tonnage of 6000t based on W. Europe use gives a use score of 4. Limited monitoring. 321 samples in NW Region of which 40 +ve. No exceedance of SIDS PNEC. Gives a monit score of 1. Overall exposure score of 4 based on use. *Hazard* - not noted to be readily biodegradable therefore score of vP. BCF and log Kow suggest not classified as bioaccumulative. Tox data suggests not classifiable. (Classified as Grp 3 in relation to ED effects on wildlife - therefore not classified as HT). Overall hazard classif of vP - 0	
5-chloro-2-(2,4-dichlorophenoxy)aniline	56966-52-0	Insufficient info	Insufficient data	Insufficient data	*Exposure* - on CSF list of concern. No data yet provided to CSF. No use or monitoring data available. Therefore overall exposure classification is 'Insufficient data'. *Hazard* - no hazard data located therefore classification of 'Insufficient data'.	
6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol	119-47-1	3	3	2	*Exposure* - SIDS review notes it is used in the polymers industry as an antioxidan/stabiliser and/or in the rubber industry as an additive. World wide prodn was noted as approc 3500t/yr. No monitoring data was available. It is included in the EA risk assessment on 'hindered phenols'. Estimate based on 10% of world production would give a use score of 3. *Hazard* - Limited data available. Only persistence data related to ready biodeg which indicated vP. Log Kow noted vB (BCF indicated not classified as bioacc as not readily taken up across gills). One acute study suggested T (others noted not classified), chronic data indicated not classified. Overall hazard score is vP, vB and T which is 4 (however see review	- - -	The EA risk assessment of alkyl phenols was considered following the peer review. Use as antioxidant primarily in rubber and thermoplastics. No UK data but EU consumption noted as 1000-5000t/yr – no producers in the UK. No monitoring data given. Hazard data suggests amendment to score given. BCF data suggest B and use this in preference to Log Kow data therefore B rather than vB. Persistence data complicated – not readily biodeg ie vP however data shows loss due to reaction with oxidants in the environment although this requires presence of sunlight – half life for this is 13days in freshwater – significantly longer in saltwater. Therefore although some data suggests lower persistence propose to retain vP classification. Tox data

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					notes)	supports classif of T. Therefore overall hazard classification is vP, B and T which gives a score of 3 (rather than the previous 4) - Risk assessment notes some risks at processing sites – may not be an issue in UK – no monit data. Further information on exposure required before proposed for EQS development Under review
Abamectin	71751-41-2	0	3	5	*Exposure* - abamectin is approved for use as an agricultural pesticide - it is an insecticide/acaricide. Approved for use on cucumber, lettuce and tomato (in protected situations) and ornamental plants. Usage stats indicated 0.0065t in 04. Also has a use as a vet med - an endectocide which has been used on cattle and sheep. No tonnage data available for this use. Gives a use score of 0. No monit data. Overall exposure score of 0 based on usage. *Hazard* - limited data. Available half lives for water and sediment suggests not classifiable. Log Kow and BCF data suggest not classifiable. Acute tox data indicate vHT. Overall hazard classification of vHT which gives a score of 3.	
Acetochlor	34256-82-1	Insufficient info	3	Insufficient info	*Exposure* - known to be a herbicide and is on list of actives to be reviewed under PPPD. No currently approved products in UK and no usage stats available. Insufficient data to propose a usage score. No monitoring data available therefore no monitoring score. Insufficient data to give an exposure score. *Hazard* - Very limited persistence data located. No sediment data or ready biodeg data. Limited water half life data suggest P. Limited bioacc data - the BCF do not suggest classif but log Kow suggest B. Acute toxicity data available - some algae/macrophytes are most sensitive - indicates vHT. No chronic data located. ED suggested but more for humans than wildlife (however tox data is key in terms of	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					classification). Overall hazard classification is P, B, vHT - giving a score of 3	
Acetone	67-64-1	4	0	5	*Exposure* – Is used as a chemical intermediate and also as a solvent. Available prodn data indicates a tonnage score of 4 (however this data is quite old and relates to prodn not use). Monit data is available for surface water and effluents. No GW data. Majority of data is for effluents. Data for 4 Regions. Approx 1000 samples with 184+ve detects. Latter primarily for effluents however surface water +ve detects ranged from 0.0007 – 4.54mg/l. Gives an exposure score of 1 as only detected in surface water in one Region. Overall exposure score of 4 based on use data. *Hazard* - persistence data suggests HP, toxicity and bioaccumulation data are available but do not suggest classification. Hazard classification of HP gives a hazard score of 0	
Acetylsulfamethoxazole		Insufficient info	Insufficient info	Insufficient info	*Exposure* - searches suggest it is a metabolite of the antibacterial sulphamethoxazole (used as an antibiotic) No usage info. No monitoring data. No exposure score. *Hazard* - No data located.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Amitraz	33089-61-1	0	3	5	**Exposure** - an insecticide. Not included on Annex 1 of PPPD. Current essential use approval in UK until Dec 07 on post harvest pear trees. Current ag use 0.465t - therefore use score of 0. Also used as a vet medicine - treatment of mange on range of animals eg dogs, pigs, cattle as well as ticks, lice etc on sheep and cattle. No figures on usage for this. No monitoring data. Overall exposure score 0 based on ag use (however doesn't take into account vet med use - use tonnage unknown). **Hazard** - very limited persistence data located - only water half life – indicates P for hydrolysis. BCF suggest B and log Kow suggests vB. Acute tox - several data points suggest T but one Daphnia study suggests HT. Chronic data suggest HT. Overall hazard classification is P,vB and HT which gives a score of 3	
Amitrol	61-82-5	1	3	3	**Exposure** - a herbicide. Included on Annex 1 of PPPD. Number of products containing amitrole approved for use in UK - mainly on areas not intended to bear vegetation, eg hard standings - includes domestic use eg paths and patios. CSL usage stats indicate 0.75t in 2004 however this may not reflect true use volumes as survey does not consider use on hard standings etc. Usage info therefore insufficient. Not on HSE list of approved actives. Exposure score based on monitoring. Monitored only in Wales - only 1 detect in nearly 1500 samples (1 surface water greater than 0.1ug/l threshold). Gives a score of 1. Overall exposure score is 1 based on monitoring data. **Hazard** - fate data limited - water half lives and ready biodeg indicate vP. BCF and log Kow data do not suggest classif under B. Tox data do not suggest classif. ED suggest HT. Overall hazard classification vP, HT which gives a score of 3	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Amoxicillin	61336-70-7 and 26787-78-0	2	Insufficient info	Insufficient info	*Exposure* – Is an antimicrobial used as a vet medicine. Data on tonnage used was obtained from the Agency's vet medicine review. This indicated a score of 2. No monitoring data avail. *Hazard* - no persistence or bioaccumulation data. Tox data suggests HT but overall hazard 'Insufficient info'	
Amprolium	137-88-2 and 121-25-5	Insufficient info	Insufficient info	Insufficient info	*Exposure* - can be used as a vet med as a coccidiostat - thought to mainly be used on poultry. Vet med review mentions it - the generic group is noted as 66t usage however do not know proportion of this that is amprolium. Insufficient data to determine use score. No monitoring data. Insufficient info to determine an exposure score. *Hazard* - very little data. No persistence or bioaccumulation data located. Acute toxicity data indicates no classif under T. Overall hazard classification however is 'Insufficient info' due to lack of persistence and bioacc data.	
Aniline (benzenamine)	62-53-3	4	2	2	*Exposure* - usage data avail on European scale from RAR (although quite old late 80s/early 90s and relates to prodn) along with type of use. Used mainly as a chemical intermediate in production of plastics, dyes, rubber, pesticides, pharmaceuticals. Use data indicates a score of 4. Monitoring data available - all Wales and NE and for FW and discharges (no GW). SW threshold exceeded in both Regions - gives a score of 2. Overall exposure score of 4 based on use. *Hazard* - water half life data indicate vP but based on estimates from soil. Thought to be readily biodegradable. BCF and log Kow data do not suggest classification under bioaccumulation. Acute and chronic toxicity data suggest T. Overall hazard classification is vP (using sediment estimate) and T which gives a score of 2.	- Persistence data is complicated by the fact that it is noted as being biodegradable and not persistent in water however in soil although degrades, once adsorbed to humic component then it is not available for degradation which increases persistence. No data for sediment but if use half life for soil then if use worst case scenario classify as vP. However if don't use worst case is overall classification of T which gives a score of 1 which gives an overall priority ranking of 3. Need to consider fate in sediment in further detail. - The ESR has indicated risk to the aquatic environment arising from aniline production and further processing. A risk management strategy is in development at EU level. It is proposed that a decision on whether to take aniline forward is put on hold to await the outcome of the strategy and that further consideration of persistence in sediment is made.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						Under review
Apramycin	37321-09-8	0	Insufficient info	Insufficient info	*Exposure* - note that it is an antibiotic used on pigs, cattle and poultry. Use noted as 0.466t in 2000 - gives a use score of 0. No monitoring data available. Overall exposure score of 0. *Hazard* - very limited data available. No persistence data. Bioaccumulation data indicate no classification. Toxicity data suggest no classification. As no fate data however overall score is insufficient info	
Aroclor 1242	53469-21-9	3	4	1	*Exposure* - PCBs were used widely in electrical equipment in capacitors and transformers but are now banned from use. Potential entry to environment however through disposal of existing equipment. Current usage figures are therefore not relevant. UK Action Plan on PCBs estimated that 8000t of PCBs remain in UK for disposal. If use this as basis could propose a use score of 3 (although entry to environment through disposal should be tightly controlled). No monitoring data available specifically for this Aroclor. Monit data for specified groups of PCBs and individual congeners note extensive monit but limited +ve detections. Generally an exposure score of 1 but based on very few detections compared to number of samples. Overall exposure score of 3. *Hazard* - Water half life data and ready biodegradability data suggest vP. BCF data suggests vB and toxicity data and endocrine data suggests HT. Gives overall hazard classification of vP, vB and HT which gives a	- High hazard ranking acknowledged. Controls already in place which ban use which ban use however significant amount still in use and to be disposed of which results in potential to reach environment. - Monitoring shows limited +ve detections. High hazard and long term concerns suggest need to consider whether derivation of EQS would bring any additional benefit on top of the controls already in place, in terms of preventing release to the environment compared to existing measures on use and disposal Under Review

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					score of 4.	
Aroclor 1248	12672-29-6	3	4	1	*Exposure* - PCBs were used widely in electrical equipment in capacitors and transformers but are now banned from use. Potential entry to environment through disposal of existing equipment. Current usage figures are therefore not relevant. UK Action Plan on PCBs estimated that 8000t of PCBs remain in UK for disposal. If use this as basis could propose a use score of 3. No monitoring data available specifically for this Arochlor. Monit data for specified groups of PCBS and individual congeners note extensive monit but limited +ve detections. Generally an exposure score of 1 but based on very few detections compared to number of samples.. Overall exposure score of 3.

Hazard - Water half life data and ready biodegradability data suggest vP. BCF data suggests vB and toxicity data and endocrine data suggest HT. Gives overall hazard classification of vP, vB and HT which gives a score of 4. | As above |
| Aroclor 1254 | 11097-69-1 | 3 | 4 | 1 | *Exposure* - PCBs were used widely in electrical equipment in capacitors and transformers but are now banned from use. Potential entry to environment through disposal of existing equipment. Current usage figures are therefore not relevant. UK Action Plan on PCBs estimated that 8000t of PCBs remain in UK for disposal. If use this as basis could propose a use score of 3. No monitoring data available specifically for this Arochlor. Monit data for specified groups of PCBs and individual congeners note extensive monit but limited +ve detections.   Generally an exposure score of 1 but based on very few detections compared to number of samples.. Overall exposure score of 3. | As above |

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - Water half life data and ready biodegradability data suggest vP. BCF data suggests vB and acute toxicity data suggests vHT. Gives overall hazard classification of vP, vB and vHT which gives a score of 4.	
Aroclor 1260	11096-82-5	3	4	1	*Exposure* - PCBs were used widely in electrical equipment in capacitors and transformers but are now banned from use. Potential entry to environment through disposal of existing equipment. Current usage figures are therefore not relevant. UK Action Plan on PCBs estimated that 8000t of PCBs remain in UK for disposal. If use this as basis could propose a use score of 3. No monitoring data available specifically for this Aroclor. Monit data for specified groups of PCBs and individual congeners note extensive monit but limited +ve detections. Generally an exposure score of 1 but based on very few detections compared to number of samples.. Overall exposure score of 3.

Hazard - Water half life data and ready biodegradability data suggest vP. BCF data suggests vB and toxicity data and endocrine data suggest HT. Gives overall hazard classification of vP, vB and HT which gives a score of 4. | As above |
| Azamethiphos | 35575-96-3 | Insufficient info | 3 | Insufficient info | *Exposure* – organophosphate insecticide. No agricultural pesticides containing azamethiphos approved for use in UK and this active has not been supported under PPPD. Non-ag pesticide approval by HSE and also used as a vet medicine – approved to control lice on salmon. No tonnage or monit data available.

Hazard - very limited data – only water half life data was available for persistence – this indicated no classification. Only a log Kow was | |

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					available for bioaccumulation – this indicated not classified. The limited toxicity data available indicated vHT. An overall hazard classification of vHT gave a score of 3	
Azinphos-ethyl	2642-71-9	2	3	2	*Exposure* - an OP insecticide. Not currently approved for use as a pesticide in UK and not included on Annex 1 under the EU PPPDirective (as suppliers did not provide data). No usage statistics available. Monitoring data available - 18938 samples (2000-2005) but only 30+ve detects of which only 11 were surface water (SW) and 5 GW (rest effluents). (LOD in range 0.005 - 30ug/l although maj in range 0.005 - 0.02ug/l). Detected in SW in 3 Regions but not above threshold. Detected in 5 Regions in the groundwater. No EQS and therefore can't consider EQS exceedances. Monitoring data indicates an exposure score of 2 (although based on very few detects compared to number of samples). *Hazard* - half life in water data indicates score of vP. No sediment or ready biodeg data available. The limited BCF/Kow data suggest no classification. Acute tox data suggests vHT (supported by a range of species). No chronic data available. Overall hazard score of vP and vHT of 3.	Although this pesticide is not approved for use in the UK and not included on Annex 1 of the EU PPPD Directive available monitoring data resulted in an exposure score of 3. The monitoring data showed few detects out of the large number of samples taken suggesting not widely detected. - At the review stage it was felt that limited data along with the fact it is not approved for use suggests that this chemical should not be put forward for EQS development. Not currently a priority for EQS development
Baquiloprim	102280-35-3	Insufficient info	Insufficient info	Insufficient info	*Exposure* - Baquiloprim is an antimicrobial used in vet medicine (uses include on cattle and pigs). Vet med review notes this group of substances has a usage of 82t however do not know what share baquiloprim had of this - therefore insuff info to determine usage score. No monitoring data available. Insufficient data to propose an exposure score. *Hazard* - no data located therefore no hazard score available.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Benzenamine, N-phenyl, styrenated	68442-68-2	2	4	2	*Exposure* - info on use indicates usage of <100t and is an antioxidant used in the stabilisation of rubber. This gives a usage score of 2. No monitoring data available therefore overall exposure score of 2. *Hazard* - very limited data available. Estimated photolysis half lives indicate rapid degradation. Indication however that not readily biodeg - indicates vP. Log Kow values suggest HB to vB. One acute tox study suggests no tox classification. vP and vB gives an overall hazard score of 4 (but based on limited data).	- Limited data is available on this compound. Has been reviewed by US EPA under HPV programme and data is being collated for ACHS. Exposure needs to be considered in more detail. - Limited hazard data ie persistent due to not ready biodeg – range of log Kow but no BCF data. Only one toxicity study. - Watching brief as further data becomes available before put forward for EQS development.
Benzidine	92-87-5	Insufficient info	Insufficient info	Insufficient info	*Exposure* - no use or monit data. *Hazard* - no persistence data, limited bioacc and tox data do not suggest a score however as no persistence data overall hazard classification is 'Insufficient info'	Under review
Benzocaine	94-09-7	Insufficient info	0	Insufficient info	*Exposure* - no use or monit data. *Hazard* - limited data available. The one persistence study indicates vP. The BCF and log Kow suggest not classified in terms of bioaccumulation. Limited toxicity data indicate not classified in terms of toxicity. Overall hazard score is vP which gives a score of 0	
Benzyl butyl phthalate (BBP)	85-68-7	4	2	2	*Exposure* – Used as a plasticiser in various products. The available use data for the EU indicates a use score of 4. Limited monitoring data available – gives a monit score of 1. Overall exposure score of 4 based on use tonnage. *Hazard* – Persistence data indicate it does not meet the classification criteria. BCF data do not indicate classification in terms of bioaccumulation however Log Kow indicates HB. Toxicity data indicate T. Overall hazard classification of HB and T gives a hazard score of 2	- High usage score – limited monit data to assess environmental levels - Hazard data suggests concern with respect to bioaccumulation. Potential endocrine disrupter – ESR assessment asked for further studies on this - ESR identified potential risks to the aquatic environment from certain production and formulation processes - Due to high usage, potential risks identified in ESR and potential ED effects propose for EQS development Priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Benzyl chloride (alpha-chlorotoluene)	100-44-7	Insufficient info	1	Insufficient info	**Exposure** – Chemical intermediate. No tonnage data (only for Japan), no monit data. **Hazard** –available persistence data does not suggest classification , nor does the BCF or log Kow data. Available toxicity data indicates T – giving an overall hazard score of 1	
Benzylidene chloride (alpha,alpha-dichlorotoluene)	98-87-3	Insufficient info	Insufficient info	Insufficient info	**Exposure** - no use or monit data. **Hazard** - limited data on persistence and bioaccumulation suggest not classified – however bery limited data set. No tox data therefore overall classification of 'Insufficient info'	
Bis(2-chloroisopropyl) ether	108-60-1	Insufficient info	Insufficient info	Insufficient info	**Exposure** - no use or monit data. **Hazard** - limited data on persistence – indicates potentially vP if use highest values. BCF and log Kow data indicate no classification for bioaccumulation. No tox data therefore overall hazard classification of 'Insufficient info'	
Bisphenol A	80-05-7	4	2	2	**Exposure** - primarily used in polycarbonate and epoxy resin prodn. High tonnage giving a use score of 4. Monit data indicates 57 samples of surface water across 6 Regions (No GW data). 44 +ve detects but no exceedance of RAR PNEC. Gives a monit score of 2. Overall exposure score of 4 based on tonnage. **Hazard** - Persistence data indicates water half lives do not meet persistence criteria and considered to be readily biodegradable. BCF and log Kow do not suggest classif under B. Tox data does not indicate classif but identified as an ED therefore HT. Overall hazard classif of HT which gives a score of 2.	- The available monitoring data is limited but indicates widespread detection in surface water across England and Wales although no levels exceeding the ESR PNEC. Hazard score is driven by endocrine disrupting potential – does not meet criteria for persistence, bioaccumulation or conventional toxicity. - Widespread detection and potential for endocrine disruption suggests potential concern. - The ESR identified potential risks to the environment and indicated a need for measures to reduce risk to the aquatic environment. Also identified need to consider toxicity to snails further as data suggested they are particularly sensitive. Bisphenol A has been included on the recent EU list of possible additional priority substances. If agreed this would result in an EU EQS. - Therefore based on this and also work ongoing from the ESR propose awaiting outcome of these before making a decision as to whether to put forward as a candidate for EQS

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						development Under review
Bromodichloromethane	75-27-4	2	0	5	*Exposure* – Used as an intermediate and solvent and present in fire extinguishers. No tonnage data therefore score based on monitoring data. Monitoring data shows widely detected – 8 Regions in GW and 4 Regions in SW. No EQS available for comparison with detected concentrations. Gives an exposure score of 2 based on monitoring *Hazard* – very limited data. BCF and log Kow suggest not classified. Very little persistence data – ready biodeg data suggests vP. Only one toxicity study located – indicated no classification under toxicity	- The substance is detected widely in surface and groundwater – need to investigate further the use and tonnage of this chemical in order to be able to identify source and exposure more clearly to help identify reason why detected widely, ie potential sources. - Effect data appears limited – need to do further review and supplement with QSAR studies if required in order to be able to further consider relevance of concns detected in the absence of an EQS. Current data available suggesting large difference between concn detected and the toxicity data located but is only one study. Further data is required on exposure and hazard to help determine whether this substance should be proposed for EQS development -
Bromoxynil	1689-84-5	2	4	2	*Exposure* – Herbicide – currently approved for use in the UK mainly on cereals and maize. Has been included on Annex 1 of PPPD. CSL usage stats for 2004 indicate 65t which gives a use score of 2. Monitored widely in GW and SW. Approx 10000 samples however only 115 +ve detects. Detected in surface water and groundwater but at concentrations well below the EQS. Gives a monit score of 2. *Hazard* - ready biodeg data indicates vP. Water half lives indicate not classified. Persistence score of vP. BCF data do not indicate classification. Log Kow data varies - indicates	Under Review - Used as a pesticide and therefore potential for direct release to the environment. Monitoring data indicates infrequent detection in the environment and at levels below the EQS - Hazard data indicates potential concern – bioaccumulation concern may be overestimated however as although Kow suggests concern BCF does not - Although hazard data indicates high concern the monit data indicates low potential for exposure as detected infrequently (LOD below EQS). - Therefore propose not currently a priority for EQS development but to keep a watching brief

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					vB. Toxicity data indicates HT. Overall hazard classification of vP, vB and HT to give a score of 4	as further data becomes available.
Bronopol	52-51-7	Insufficient info	Insufficient info	Insufficient info	*Exposure* – anitmicrobial agent – used as a preservative in pharmaceuticals as well as cosmetics and shampoos. Use in the latter two areas decreasing. Also used as a biocide in a range of industrial applications, eg the paper industry. No indication of tonnage used. Monit data only available for discharges *Hazard* - limited data - no persistence data, BCF data indicates not classified for bioaccumulation (no Log Kow data). Toxicity data indicates not classified. Overall hazard classification of 'Insufficient info' due to absence of persistence data	Under review
Carbendazim	10605-21-7	3	3	2	*Exposure* - use data gives score 3. Detected widely in surface and groundwater - 2 *Hazard* - data available suggests vP and HT - 3	- high usage and monit data indicates detected in env - hazard data indicates potential for concern - concentrations detected often close or above the proposed AA - due to detection in environment at levels close to EQS and its high toxicity propose for EQS development Priority for EQS development
Cephalexin	15686-71-2	1	Insufficient info	Insufficient info	*Exposure* - antibiotic used in vet medicine. NOAH notes used on cats and dogs. Also a human pharm as noted in human pharm review - noted 2000 prescriptions in 1997 - but no tonnage data. Vet med review notes 1.3t sold in UK in 2000 - gives a use score of 1. No monitoring data available therefore overall exposure score of 1 (although doesn't take into account human pharm use). *Hazard* - no persistence or toxicity data located. A log Kow suggests not classified under bioacc. Insufficient data to give a hazard score.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Chloral hydrate	302-17-0	3	Insufficient info	Insufficient info	*Exposure* – limited information on use – indicates used as an intermediate in pesticide manufacture. Has been used as a sedative although unclear if this is still the case in the UK. Can also be formed as a by-product in the chlorination of drinking water. Tonnage data indicated use score of 3. No monitoring data available use data -3. No monit data. *Hazard* - limited data - no persistence data. Log Kow indicates no classification under bioaccumulation. No BCF data. Limited toxicity data available – does not indicate classification. Overall hazard classification of 'Insufficient info' however due to lack of persistence data.	
Chloridazon	1698-60-8	3	2	2	*Exposure* - use data - 3. Monit data, detected widely, no EQS - 2. *Hazard* -limited data - HP and T - 2	- herbicide with moderate usage – lower in 2004 so used previous years data to assess trend. Yet to be reviewed under PPPD. Detected widely in GW and SW - limited hazard data suggests not bioaccumulative. Most data indicates not classifiable under tox but a couple of studies suggest T - although detected the concns are significantly below the reported effect concentrations. Most tox data suggest not classifiable. - Based on the above consider not to be a priority for EQS development at present but to keep a watching brief – particularly of the outcome of the PPPD review Not currently a priority for EQS development
Chlormequat chloride	999-81-5	2	0	5	*Exposure* - plant growth regulator. Approved in UK for agricultural use in a number of products - primarily used on cereals. To be reviewed under PPPD. Approx 50t used in 04 - gives use score of 2. Monitoring data available - surface water data all relate to PIs. Monitored in GW in 7 Regions - only 5 detects out of nearly 2000 samples. Detected in 2 Regions. No EQS therefore monit score of 2. Exposure score therefore of 1.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - limited data located. Limited persistence data - indication that readily biodegradable, biodegradation thought to be key process. Long half lives reported for hydrolysis and photolysis but water sed half life of 35d reported indicating P. BCF and log Kow data suggest no classification under bioaccumulation. Acute and chronic tox data suggest no classification under toxicity. Overall hazard classification of P which gives a hazard score of 0.	
Chloroacetic acid	79-11-8	4	0	5	*Exposure* - use gives score of 4. No monit data. *Hazard* - available data suggests no classification - 0	
Chlorobenzene	108-90-7	4	0	5	*Exposure* - use data - 4. Monit data - 3 as exceedance of LT PNEC in 1 Region. *Hazard* - avail data indicates vP - 0	
Chloronaphthalenes		Insufficient info	Insufficient info	Insufficient info	*Exposure* - no use or monit data. *Hazard* - no persistence data. However bioacc and tox data suggest vB and vHT	
Chloroprene (2-chloro-1,3-butadiene)	126-99-8	Insufficient info	0	Insufficient info	*Exposure* - no tonnage data. No monit data. *Hazard* - data given suggests no classification	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Chlorotetracycline	57-62-5	1	Insufficient info	Insufficient info	**Exposure** - antibiotic used in vet medicine and as a human pharmaceutical. Vet med usage was 6.2t in 2000 - used on pigs, cattle but also fish. No data for human pharm usage. Based on vet med usage would give a usage score of 1. No monitoring data available. Overall exposure score therefore 1 (but only based on vet usage). **Hazard** - no persistence or bioaccumulation data. Acute tox data limited - most suggests no classification - one algal study suggests HT. Overall hazard classification as insufficient data.	
Chlorothalonil	1897-45-6	4	3	1	**Exposure** – Fungicide currently approved for use on a wide range of crops including cereals such as wheat and barley, a range of vegetables, fruit such as blackcurrant and on amenity turf. It has been included on Annex 1 of the PPPD. CSL use stats for 2004 indicate high tonnage ie 1567t which gives a use score of 4. Monitored in all Regions in GW and in 3 Regions for surface water. Approx 3500 samples however only 4+ve detects in 1 GW sample and 3 SW samples across 2 Regions. This gives a monit score of 1. Therefore most samples indicated below LOD which was in the range of 0.01-0.04ug/l. **Hazard** – ready biodeg data indicates vP however water half life data suggests P. Log Kow and BCF data suggest not classified under bioaccumulation. Acute and chronic toxicity data indicate HT. Overall hazard classification of vP and HT gives a hazard score of 3	- High usage. Widespread monit data for GW but more limited for surface water. Very few positive detections - Hazard data indicates potential for concern - Due to usage and hazard data propose as a priority for EQS development Priority for EQS development
Chlorotoluidines (other than 2-chloro-p-toluidine)		1	Insufficient info	Insufficient info	**Exposure** - no use data. Monit data predom discharge data - detected in 1 Region - 1. **Hazard** - no persistence, bioacc or toxicity data	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Chlorotoluron	15545-48-9	3	3	2	**Exposure** – Herbicide approved for use in the UK on a range of cereals. CSL usage stats for 2004 indicate a use and tonnage score of 3. Is included on Annex 1 of the PPPD. Monitoring data available – over 23000 samples however only 1209 +ve detects (5%). Monitored in a number of Regions in SW and GW (approx 5 Regions). A handful of samples showing concentrations higher than the AA although not direct comparisons with one off samples. Exposure score of 3 based on usage. **Hazard** - persistence gives vP . Algal data suggests HT - which gives score of 3.	Used widely as a herbicide and at relatively high tonnage. Large amount of monitoring data ie approx 23000 samples, across a number of Agency Regions and of both surface and groundwater however majority of concentrations detected were below the EQS. A few samples noted concentrations higher than the AA but not directly comparable as one off values – no MAC exceedances among the environmental concns. - Hazard score reflects potential high toxicity to algae/plants - Although potential hazard current exposure data suggests not causing EQS exceedances and therefore propose not a priority for development at this time.
Chlorpropham	101-21-3	2	0	5	**Exposure** - is used as a plant growth regulator. PSD have approved a number of products containing chlorpropham for use on range of crops, eg beet, carrot, onoins, some flowers. Also used on stored potatoes. CSL pest stats shows 16.5t used in 2004. Has been included on Annex 1 of PPD. Use data gives a score of 2. Monitoring data available - 926 samples (393+ve detects) - all data for Anglian Region. EQS AA not exceeded - one sample suggested MAC exceedance but source not specified therefore not considered reliable. Monit data Indicates score of 1. Overall exposure score of 2 based on use data. **Hazard** - limited persistence data with no info for sediment or ready biodeg. Water half lives indicate vP. BCF and log Kow data indicate no classification under bioaccumulation. Acute and chronic tox data indicate no classification under toxicity. Gives an overall hazard classification of vP which gives a score of 0	Not a current priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Clavulanic acid	58001-44-8	1	Insufficient info	Insufficient info	**Exposure** - antibiotic used in vet meds. Usage in 2000 noted as 2.194t. Gives a use score of 1. No monitoring data available. Overall exposure score of 1. **Hazard** - no data available. Therefore classification of 'Insufficient info'	
Clindamycin	18323-44-9	0	Insufficient info	Insufficient info	**Exposure** - antimicrobial used as veterinary medicine. Vet use low tonnage therefore use score of 0. No monitoring data. Overall exposure score of 0. **Hazard** - no hazard data located therefore no hazard score possible.	
Clopidol	2971-90-6	Insufficient data	Insufficient info	Insufficient info	**Exposure** - vet medicine - coccidiostat for use on poultry for example. No specific tonnage info - vet med review noted total group usage was 66t. However as no specific data on clopidol insufficient data to give usage score. No monitoring data. Overall exposure score of 'Insufficient info'. **Hazard** - no hazard data located therefore no hazard score available.	
Clopyralid	1702-17-6	2	0	5	**Exposure** – Herbicide approved for use in UK on a range of crops, eg barley, beet, linseed, oilseed rape, amenity grassland, oats and lawns. Included on Annex 1of PPPD. CSL usage stats for 2004 indicated 24t which gives a use score of 2. Available monit data indicates monitored across all Regions in GW but only in Anglian for SW. Mainly below LOD but some detects in range of 0.01-0.64ug/l for GW and 0.02-0.43ug/l for SW. Of the approx 7000 samples only 70 +ve detects (0.9%). As no EQS but detected in GW across a number of Regions gives a monit score of 2. Exposure score of 2 based on use and	- Herbicide approved for use on a range of crops and has been monitored in GW across the Regions. Detected widely but no EQS therefore score of 2 which is as per use score. - Hazard data is limited but indicates limited concern - as although data indicates high persistence is not thought to bioaccumulate and is of relatively low toxicity. - As data indicates low hazard and tox data is significantly higher than concns detected proposed not a priority for development at this time Not currently a priority for EQS development

Prioritising chemicals for standard derivation under Annex VIII of the Water Framework Directive

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					monit. *Hazard* - data limited for this chemical. Available persistence data suggests vP. Bioaccumulation and toxicity data do not suggest classification under hazard. Gives a hazard score of - 0	
Clotrimazole	23593-75-1	Insufficient info	Insufficient info	Insufficient info	*Exposure* - used as a human pharmaceutical and a vet med - is an antifungal agent. No info on tonnage used available. No monitoring data available. Overall exposure score therefore 'Insufficient info'. *Hazard* - no data available, therefore hazard score of 'Insufficient info'	
Coumaphos	56-72-4	0	3	5	*Exposure* - OP insecticide. No current ag approvals and no CSL pest stats which suggests has not been used for ag pest purposes. Not included for review under PPPD. Has been used as a vet med as a sheep dip - no current approvals for this. No tonnage data available. Monitoring data indicates only 2+ve detects out of 1867 samples of which only one was an env concn. Monitored in GW in 6 Regions and in SW in 3 Regions however only 1+ve detect but not above threshold and not an EQS exceedance. Gives a monit score of 0. Overall exposure score of 0. *Hazard* - limited data available. Half lives in water indicate P. Log Kow suggests B. Acute tox data indicates vHT. Overall hazard classification of P,B and vHT - gives a score of 3	
Cyanuric chloride (2,4,6-trichloro-1,3,5-triazine)	108-77-0	4	Insufficient info	Insufficient info	*Exposure* - annual prodn noted to be 100000t. Used as an intermediate in the production of pesticides, optical brighteners, dyes and plastic additives. Usage data gives a score of 4. No monit data available. Overall exposure score of 4 based on usage. *Hazard* - limited data set. Data for water indicate hydrolysis is key process and occurs rapidly - order of hours. No classification under persistence. BCF and log Kow data indicate no	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					classification under bioaccumulation. No tox data - noted as difficult to test due to low solubility and rapid hydrolysis which does not allow testing of chemical. Overall hazard score of 'insufficient data' due to lack of tox data.	
Cyclododecane	294-62-2	Insufficient info	4	Insufficient info	*Exposure* - noted as an intermediate for production of chemicals used to make polyamides, polyesters, synthetic lubricating oils, used as a solvent. No tonnage info. Therefore no usage score. No monitoring data available. Therefore overall exposure score of 'Insufficient info' *Hazard* - limited data - only half life data relates to volatilisation which indicates no classification although may not be the case on adsorption to sediment. One source indicates ready biodeg but two others indicate not readily biodeg which indicates vP. BCF and log Kow data suggest vB - supported by various sources. Acute and chronic tox data available - wide ranging data - worst case indicates vHT for acute and HT for chronic. Hazard therefore vP, vB and vHT which suggests 4	
Cypromazine (cyromazine)	66215-27-8	Insufficient info	3	Insufficient info	*Exposure* - used as a veterinary medicine (eg treatment of blow fly on sheep and rabbits). No data on quans used in vet med review. Also is an agricultural insecticide - not currently approved in UK however and no CSL usage stats data. Yet to be reviewed under PPPD. Approved HSE active - insecticide but not clear for what, possibly flea control - professional and amateur products). No use quantity data. Use score not possible. No monit data therefore score not possible. No exposure score due to insufficient info. *Hazard* - very limited data. Half life data for water/sed studies indicate vP. BCF and log Kow data suggest not classifiable under bioaccumulation. Acute and chronic toxicity data seems to vary - lowest acute suggests HT,	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					lowest chronic T. Therefore hazard suggest vP and HT which gives a score of 3	
DDD (pp)	72-54-8	insufficient info	4	insufficient info	*Exposure* - degradation product of DDT which is a banned pesticide. No use or usage figures as a deg product. No monitoring data. Insufficient data therefore to propose an exposure score. *Hazard* - water half life data indicates vP. Limited sed data indicates vP. No specific ready biodeg data. BCF and log Kow values indicate vB. Acute toxicity data indicates vHT, no chronic data available. Overall exposure score is vP, vB and vHT which gives a hazard score of 4.	
DDE (pp)	72-55-9	2	4	2	*Exposure* - degradation product of DDT which is a banned pesticide. No use or usage figures as a deg product. Monitoring data available (47624samples) - approx 320 +ve detects (0.7%). +ve detects in SW in 7 Regions but only above threshold for 2 samples (both in Southern Region and in relation to PI). Detected in GW in 5 Regions - gives a monitoring score of 2. *Hazard* - water half life data indicates vP, the limited sed data indicates vP. No ready biodeg data. BCF and log Kow data indicate vB. Acute toxicity data suggest vHT. No chronic data located. Data suggest possible ED. Overall hazard classification therefore vP, vB and HT/vHT suggesting a score of 4.	- DDE is a degradation product of DDT – however the latter is not approved for use in the UK. The exposure score was driven by available monitoring data. However although it was detected the number of actual detections was low considering the number of samples ie only 0.7%. It was therefore felt that this along with the fact it is a degradation product of a pesticide not approved in this country lowers the potential for exposure and therefore the substance should not be put forward for EQS development Not currently a priority for EQS development
Decoquinate	18507-89-6	Insufficient info	Insufficient info	Insufficient info	*Exposure* - veterinary medicine (endoparasiticide used on eg cattle). No specific use data but vet med review notes group usage of 0.18t. Although no specific info on decoquinate suggests a use score of 0. No monitoring data therefore no monit score. If base on group usage data gives usage score of 0 (but based on limited data) but generally 'Insufficient info' for this chemical	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - no persistence data. Log Kow data suggests vB(no BCF data), acute toxicity data avail which suggests no classif as T. However no hazard score possible due to lack of persistence data. Insufficient info.	
Deltamethrin	52918-63-5	1	4	3	*Exposure* - synthetic pyrethroid insecticide. Approved for range of agricultural uses, primarily veg but also apple, barley and hops. Included on Annex 1 of PPPD. Also approved by HSE - number of products to control insects eg ants and fleas. Vet medicine product eg control of blow fly, ticks etc on orgs such as dogs, cattle and sheep. Wide range of uses therefore however usage figures only for plant protection uses. Indicates score of 1 (may underestimate usage however as only based on ag use data). Monitoring - 9 +ve out of 407 (surface and groundwater) samples but none above trigger values. Monitored in 6 Regions. Monit score of 0. Overall exposure score of 1. *Hazard* - data indicates not readily biodeg therefore assigned classification of vP. Log Kow suggests HB and acute and chronic tox suggest vHT. Gives hazard classif of vP, HB and vHT ie 4.	
Demeton-S-methyl	919-86-8	0	3	5	*Exposure* - OP insecticide. No current ag approvals in UK and not on HSE list of actives. Has not been supported for consideration under PPPD. CSL pest usage stats for 04 indicate low usage - 0.038t. Indicates use score of 0. Monit data indicates 2+ve detects from 1964 samples. Monitored in SW in 6 Regions and in GW in 1 Region. However no detects above the thresholds (LOD was in range of 0.01 - 10ug/l although mainly in range 0.01 - 0.05ug/l). Gives a monit score of 0. Overall exposure score of 0 based on use and monit.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - very limited data available. Only half lives available for hydrolysis in water - indicates HP for neutral waters. No data for sed or ready biodeg. Log Kow and BCF data suggest not classifiable under bioaccumulation. Acute tox show high tox to some inverts - vHT. Overall hazard classif of HP and vHT which gives a score of 3.	
Demeton-S-methyl sulphone	17040-19-6	0	Insufficient info	Insufficient info	*Exposure* - OP insecticide. No current ag approvals in UK. Has not been supported for consideration under PPPD. Latest CSL usage stats were for 1997 which indicated 0.001t used. Usage score of 0. Monit data shows total of 34 samples in 2 Regions but mainly NW for surface water - no detects above LOD (0.01ug/l). Monit score of 0. Overall exposure score of 0 based on use and monit. *Hazard* - no data was located. Overall score of 'Insufficient info'	
Desethyl atrazine	6190-65-4	2	Insufficient info	Insufficient info	*Exposure* – Identified as a breakdown product of atrazine. Therefore no use or tonnage data available. Score driven by monit data – monitored widely in groundwater with samples availlable for all Regions, data for 2 Regions in surface water. Approx 4000 samples – a number of +ve detects. Detected in a number of Regions which gives a score of 2. No EQS for comparison. *Hazard* - Very limited hazard data - no persistence data. BCF and logKow indicate not classifiable. Limited toxicity data. As no persistence data is classified as 'Insufficient info'.	- Monitoring data indicates detection with info primarily for GW but some SW. Detected widely in GW - Limited hazard info therefore not possible to rank (It was noted that it may be possible to read across from atrazine or undertake QSAR work to fill data gaps if required) - As it is a degradation product control would be via the parent product atrazine. Atrazine has been reviewed under PPPD. It was not included on Annex 1and therefore its use is being phased out in terms of its agricultural uses – some essential uses may be kept until 2007. - Therefore although there is insufficient data for classification suggest that it is not currently a priority for EQS development as parent product use is to be restricted. Not currently a priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Desisopropyl atrazine	1007-28-9	2	Insufficient info	Insufficient info	**Exposure** – Identified as a breakdown product of atrazine. Therefore no use or tonnage data available. Exposure score driven by monit data. Monitored across all Regions in GW – approx 3000 samples. +ve detects in a number of Regions to give a monit score of 2. No EQS available for comparison. **Hazard** - very limited data. No persistence or toxicity data therefore overall classification of 'Insufficient info'	- Monitoring data indicates detection with info primarily for GW. Detected widely in GW - Limited hazard info therefore not possible to rank (It was noted that it may be possible to read across from atrazine or undertake QSAR work to fill data gaps if required) - As it is a degradation product control would be via the parent product atrazine. Atrazine has been reviewed under PPPD. It was not included on Annex 1and therefore its use is being phased out in terms of its agricultural uses – some essential uses may be kept until 2007. - Therefore although there is insufficient data for classification suggest that it is not currently a priority for EQS development as parent product use is to be restricted.
Dextropropoxyphene	469-62-5	1	Insufficient info	Insufficient info	**Exposure** - used as a human pharm. No specific usage info. Listed as one of top 10 prescribed pharms in UK in 1997. Insufficient info to give usage score. Monitored for in the human pharm targeted monit programme - detected downstream of all 5 STW and at levels above the freshwater threshold at a number of these. Gives a monit score of 1. Overall exposure score of 1 based on limited monit data. **Hazard** - very limited data available. No half life data in water or sediment. Ready biodeg info suggests vP. No BCF located but Log Kow suggests B. No toxicity data located. As no tox data hazard score is 'Insufficient data'.	Not currently a priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Di(tert-dodecyl) pentasulphide	31565-23-8	Insufficient info	4	Insufficient info	*Exposure* - no info on use or monitoring. Included on CSF list - notes is being reviewed under UK Coordinated Chemical Risk Management Programme.	
					Hazard - very limited data. Only ready biodeg data which suggests vP. Log Kow data suggests vB. Acute tox data suggests T. Hazard classif of vP, vB and T, ie 4 *(but based on very limited data)*	
Dibromochloromethane	124-48-1	2	0	5	*Exposure* – Used as a chemical intermediate but no tonnage data located. Monitored across all Regions in GW and in a number for SW. Approx 15000 samples. +ve detects in a number of samples – approx 800. Gives an exposure score of 2 (no EQS).	- Widely detected in surface and groundwater in E&W – however very little info on use or tonnage used. As detected in samples need to identify data on potential uses/sources - Hazard data is limited – very little toxicity data. Limited data suggests toxicity at concentrations significantly higher than the concentrations detected. - Available data indicates low hazard however due to the limited data set and the fact that it is detected in the environment propose that it is not put forward for EQS development at this stage but that further data is obtained on its use and hazard. Under Review
					Hazard - limited data – persistence data suggests volatilisation is rapid. Degradation half lives in the order of weeks to months. Suggests vP. Log Kow and BCF data indicates not classifiable. Very limited toxicity data – suggests not classifiable	
Dibutyl phthalate	84-74-2	3	2	2	*Exposure* - data indicates is used as a softener mainly in plastics but also printing inks, film coatings, sealants and cosmetics. Tonnage data for 1998 indicate a use score of 3. Monit data shows 13 samples with 10+ve detects but mainly of trade waste and therefore not relevant. Data for Anglian and Midlands region. SW data does not exceed threshold ie 0.02-0.066ug/l Insufficient data to give a monit score. Overall exposure score of 3 based on use.	- The review noted that the ESR had not identified a risk to the environment from dibutyl phthalate. The available monit data was compared with the ESR PNEC. The latter is 10ug/l which was above the concns detected and is above the mean surface water data quoted in the ESR which is in the range 0.1 – 1ug/l. - The hazard data show limited persistence – data on bioaccumulation is variable in terms of BCF data with lower values suggesting no classif and upper values suggesting vB. HB was used as classification. A revisit of the tox data suggest a classification of T rather than vHT – the two studies generating vHT were outliers at the time but also re-checking showed
					Hazard - limited data on persistence - indicates readily biodeg - no classification. Log Kow and BCF indicate HB. Some acute tox studies indicate vHT but mainly T. Some indication of ED but mainly for humans. Overall hazard score	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					of HB and vHT to give 3 (see review notes).	a change of units. However still gives overall priority ranking of 2. - As the ESR indicate no risk, the concentrations detected in surface water were below the EQS and the hazard posed is less than originally considered it is proposed that at this stage dibutyl phthalate is not considered for EQS development. Not currently a priority for EQS development
Dichloroanilines	27134-27-6				No data located on the group of chemicals as a whole. 3,4-dichloroaniline has been considered as an individual substance	
Dichlorobenzene (sum of all dichlorobenzene isomers)	25321-22-6				See individual dichlorobenzenes (see above)	
Dichloronitrobenzenes		Insufficient info	0	Insufficient info	This is a group of chemicals which makes assessment more difficult. Three common isomers are 3,4-, 2,4- and 2,3-dichloronitrobenzene. Data on these has been used to make the assessment. *Exposure* - Data on usage indicate primarily used as chemical intermediates eg in the production of dyes, pesticides etc. No tonnage data is available. No monit data is available. *Hazard* - limited data is available. Volatilisation half lives are available which indicate HP for 2 of the isomers however they are not considered to be readily biodegradable ie vP. Where BCF and log Kow data are available they do not suggest classification under bioaccumulation. The limited toxicity data does not indicate classification.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Overall hazard classification of vP which gives a score of 0.	
Diclazuril	101831-37-2	0	Insufficient info	Insufficient info	*Exposure* - veterinary medicine - coccidiostat for treating eg. poultry and lambs. No specific use data - but in vet med review notes the group tonnage is 0.18t - unclear as to diclazuril proportion but indicates low tonnage. Suggests use score of 0. No monit data. *Hazard* - no persistence data located. Log Koc and BCF indicate HB and vB respectively. Acute tox data suggest T. No persistence data however there noted as insufficient info	
Diclofenac	15307-86-5	1	0	5	*Exposure* - human pharm (nonsteroidal anti-inflammatory) - no specific use data. Over 7000 prescriptions in UK in 1997 (11th most prescribed). Included in human pharm targeted monit. Detected downstream of all 5 STW and at levels above freshwater threshold at a number of the sites. As detected in 2 Regions gives an exposure score of 1 (based on limited data). *Hazard* - limited data avail. Persistence in water notes biodeg, hydrolysis and volatilisation not thought to occur. Photolysis is main deg route with half lives of 4-8days reported. One study suggests not readily biodeg therefore vP. Log Kow suggests HB but BCF doesn't suggest classif. Limited tox data suggests no classif. Hazard score is vP and HB, ie 0 (based on v limited data)	
Dicofol	115-32-2	0	4	5	*Exposure* - acaricide. Currently no approved products in UK. Usage in 2004 was 0.048t. EU ban on dicofol containing less than 78% of pp-dicofol or more than 1g/kg DDT and DDT related compounds since 1991. To be reviewed under tranche 3 of PPD. Use score of 0 based on 04 data. No monit data. Overall exposure score therefore 0 based on usage.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - half life data for water indicated classification as P (hydrolysis key deg process), however ready biodeg studies suggest vP. Log Kow indicates B however BCF data indicates vB. Acute and chronic toxicity data and ED data indicate HT. Overall hazard score of vP, vB and HT gives a score of 4	
Diethyl phthalate	84-66-2	3	0	5	*Exposure* - Diethyl phthalate is used as a plasticizer and solvent in a wide variety of consumer products, including plastic packaging films, cosmetic formulations, and toiletries. Tonnage used is estimated as 2000t based on 1999 European prodn data. Gives a use score of 3. Limited monit data - only 6 samples in total in 2 Regions with only 2 being surface water (others waste) - only 2+ve detects in one Region. No EQS exceedances. Gives a monit score of 1. Overall exposure score of 3 based on usage. *Hazard* - water half life data suggests P with biodeg being the main deg route. No sed half life data but not thought to adsorb to sed. No clear ready biodeg data but suggests not vP. BCF and log Kow data indicate no classif under B. Acute, chronic and ED data available but do not indicate classification. Overall hazard score of P which gives a score of 0.	
Diethylamine	109-89-7	4	0	5	*Exposure* - range of uses including as a chemical intermediate, corrosion inhibitor and solvent. Used in paints, lacquers and varnishes. Usage data on IUCLID notes high tonnage giving a score of 4. No monit data. Overall exposure score therefore 4 based on use data. *Hazard* - limited data on persistence. Half lives in water short and do not indicate classification. Ready biodeg conflicting but overall data indicates not classifiable under P. BCF and log Kow data indicate not classifiable under B. Only acute tox data available - indicates not classifiable. Overall hazard score is 0	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Diflubenzuron	35367-38-5	0	3	5	**Exposure** - insecticide. Currently approved for use in UK in a few products in a range of situations eg forestry, livestock housing, fruit and veg. To be reviewed under PPD. Gradual decline in tonnage used. Most recent data (04) indicates approx 0.5t. Gives a use score of 0. No monit data available. Overall exposure score of 0. **Hazard** - Data indicated classif of P based on water half lives. No ready biodeg data available however biodeg thought to be key process. BCF and log Kow suggest no classif under B. Acute tox indicates vHT (to inverts). Overall hazard classif of P,vHT which gives a score of 3	
Dihydrostreptomycin	128-46-1	1	Insufficient info	Insufficient info	**Exposure** - vet med (antimicrobial). Approx 6t sold in 2000. Gives use score of 1. No monit data. **Hazard** - no hazard data located.	
Dimethicone	9016-00-6	3	Insufficient info	Insufficient info	**Exposure** - appears to have a wide range of uses. Vet med (enteric bloat preparation) - use of 0.269t in 2000. Noted as a treatment for head lice. Component of cosmetics, eg moisturisers, shampoo, tile sealants, antiadhesion coatings, water repellant in sunscreen, component of antacid preps, in silicone emulsions, greases and pastes, lubricants, hydraulic etc oils. US data from 1973 shows 9000t in US - 20% gives approx 2000t. Potentially wide usage but very limited usage data. Use score of 3 from limited/old data. No monitoring data avail. **Hazard** - very limited data. No persistence half lives noted although general info indicates volatilisation, hydrolysis and photolysis are not imp and biodegradation is slow. BCF and log Kow data indicate B. Limited tox data suggest	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					not classified. Insufficient data to classify.	
Dimethyl phthalate	131-11-3	4	0	5	*Exposure* - used as a plasticiser in a range of uses eg resins, rubber, lacquers, plastics, coatings and as an insect repellent. Tonnage data quoted from IUCLID indicates high tonnage - giving a use score of 4. Very limited monit data - only 4 samples (all Anglian) of which all were 'less than' results and related to waste rather than environmental concentrations. Overall exposure score therefore 4 based on use data. *Hazard* - data indicates rapid degradation and not classifiable under P. BCF and log Kow data do not indicate potential to bioaccumulate. Acute and chronic tox data do not indicate classif under T. Overall hazard score of 0	
Dimethylamine	124-40-3	4	0	5	*Exposure* - range of uses including as a chemical intermediate, in polymers, pharms, stabiliser, vulcanising agent. Tonnage data indicates high tonnage giving a use score of 4. Limited monit data available - only 27 samples (only 8+ve detects) - all for Anglian Region and all trade and sewage therefore not directly relevant to env concns. Overall exposure score of 4 based on use. *Hazard* - limited persistence data available - indicates no classification under P. BCF and log Kow data do not indicate classif under B. Toxicity data do not indicate classif under T. Overall hazard score therefore 0.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Dioctadecyl 3,3'-thiodipropionate	693-36-7	3	4	1	*Exposure* - Limited info on use. Indicates is used as a plasticiser and antioxidant for thermoplastics/rubber etc. US prodn in 1981 noted as approx 1000t but old data. Noted as CSF substance. Limited data suggest use score of 3. No monitoring data. Overall exposure score of 3 but based on limited data. *Hazard* - very limited data set. Only persistence data was an indication that not ready biodegradable ie vP. A log Kow indicates vB and acute tox data suggests not classified. Gives hazard score of vP and vB ie 4 - but based on very limited data	- The assessment has been made on a limited data set. No monitoring data was available and therefore exposure based on use data however this was very old data and related to US prodn figures. - The hazard data was also limited and suggest vP and vB but not toxic. - Data was considered to be too limited at this stage to make a decision to take the substance forward for EQS development – further information particularly on exposure is required. Need to review as further data becomes available Under review
Dioctyl phthalate	117-81-7	4	4	1	*Exposure* - Primarily used as plasticiser in PVC. High tonnage gives a use score of 4. Very limited monit data - only 4 samples from Anglian and all of waste - one positive detect (0.2ug/l). Overall exposure score therefore based on tonnage to give 4. *Hazard* - persistence data conflicting. Half lives in water reported in the order of 30-60days (ie P-vP), estimated half life in sediment indicates vP - ready biodeg data is variable - some studies indicating ready biodeg and others not. Based on worst case data propose vP. BCF suggest B but log Kow vB. Acute and chronic tox data suggest T (ED data suggests issue for humans (Grp 1) but Grp 3 for wildlife). Overall hazard classif vP, vB, T - 4	Dioctyl phenol includes diethylhexyl phthalate (which in fact this CAS number relates to) – DEHP has been considered in Annex X and therefore removes the need to be considered for EQS development Captured under Annex X as DEHP
Dioxins (PCDDs)		Insufficient info	4	Insufficient data	*Exposure* - by-product formed during combustion and some chemical processes - therefore no specific use data. (Pl emission data may give an indication but poor records for water - air emissions v low and do not meet the threshold criteria) No monitoring data available. *Hazard* - data for individual dioxins indicates vP, vB and vHT - 4	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Diquat	231-36-7	2	3	2	**Exposure** - herbicide. Used widely in agriculture on a range of crops including cereal, veg, linseed, hops, forestry, hardstandings. Included on Annex 1 of PPPD. Has been used as an aquatic herbicide however only restricted approval at moment for this and not approved for this use under Annex 1. Usage gives a score of 2. Monitoring data (995 samples, 39+ve detects) available for two Regions (S and NE) but only +ve detects are in trade and sewage therefore score of 0. Overall exposure score of 2. **Hazard** - data on persistence notes hydrolytically stable, will photodegrade in order of days but adsorbs rapidly to sediment and suspended particles which will limit photodeg. Half life in water noted as 12-24hrs. Indicates not classifiable as P in water. However adsorbs rapidly to sediment where it is thought to persist (although no half lives provided). Not thought to be readily biodeg which gives a classification of - vP. BCF and log Kow indicate not classifiable under bioaccumulation. Acute tox data indicates HT - not classifiable with chronic data. Hazard classif therefore vP and HT which gives 3.	Widely used herbicide and included on Annex 1 of PPPD – use as an aquatic herbicide is not covered by current PPPD Annex 1 inclusion and this use is currently restricted. Not detected above LOD in surface waters. Adsorbs strongly to sed where likely to persist – highly toxic to algae. Not detected in surface water – not propose for EQS development at this stage – review as further data becomes available, particularly discussion re: use as an aquatic herbicide. Under review
Disulfoton	298-04-4	0	3	5	**Exposure** - insecticide. Currently no products approved for use in UK. Not supported under PPPD. Usage data available for 02 (7.8t) (no use recorded on CSL stats for 03 and 04) but as no current uses propose a use score of 0. No monit data available. Overall use score therefore 0. **Hazard** - water half lives have been reported in the order of 3-21d and 7-41d - indicates a classification of HP. Log Kow suggest a classif of B, most BCF data suggest not classified. Acute tox data indicates classif of vHT (no chronic data). Overall hazard classif HP, B, and vHT - gives a score of 3	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Dodecylphenol, mixed isomers (branched)	121158-58-5 (mixed isomers 27193-86-8)	4	3	1	*Exposure* - tonnage and use data available from EA risk assessment (CSF substance). Used primarily as a chemical intermediate in the production of oil and lubricant additives for road vehicles and marine engines. Also used to make phenolic resins for printing inks, rubber compounding for tyres and varnishes. Prodn site in UK. EU consumption figures of 50000t give a score of 4. No monitoring data available. Overall exposure score 4 based on use data. *Hazard* - not readily biodegradable therefore vP. BCF and log Kow indicate vB. Tox data indicates T. Gives an overall hazard score of vP,vB,T ie 4. (see review notes)	- The RA undertaken by the Agency indicated potential risks to surface water from a number of use scenarios eg formulation of printing inks. - Degradation classif is supported by data in the RA. The BCF noted in the RA is 832 which is much lower than that originally used. If use this to classify and also use the BCF rather than the log Kow data then the classification is B rather than vB. Available tox data indicates HT rather than T. This gives overall hazard classif of vP, B, HT which gives a hazard score of 3. - This is to be considered for risk management by Defra. Propose await outcome of the risk management and also gain further detail on exposure prior to deciding to take forward for EQS development
Doramectin	117704-25-3	Insufficient info	Insufficient info	Insufficient info	*Exposure* - used as a vet med (endectocide in cattle, sheep & pigs). No specific use data for doramectin in vet med review - use data for a group is noted as 0.09-0.18t but no indication of proportion of this that is doramectin. Suggests low tonnage however. No monit data available. Although no specific data exposure score likely to be 0 but insufficient data to assign a score. *Hazard* - no persistence data located. Log Kow data indicates B as does calc BCF. Acute tox data indicates vHT. Overall hazard classif however is 'insuff info' due to lack of persistence data (*however even if high vP would not affect the score gained by B and vHT ie 3*)	Under review
EDTA (Ethylenediaminetetraacetic acid)	60-00-4	4	0	5	*Exposure* – Used as a chelating agent, eg in detergents, pesticides. Tonnage data indicates a use score of 4. Monit data all below LOD. Use data therefore drives the exposure score *Hazard* – bioaccumulation and toxicity data do not meet the classification criteria. Persistence data indicates vP which gives an overall hazard	- Use data indicates high tonnage but monit data all below LOD - Hazard data indicate low hazard - Low hazard and presence in environment below LOD suggests not a priority for development - ESR risk assessment however did identify a potential risk to the environment and a risk

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					score of 0.	reduction strategy is being developed. - In addition has recently been identified for possible inclusion on WFD list of priority substances - Not identified as high priority based on available data. Two initiatives underway which may affect EDTA and EQS development ie the ESR risk management strategy and the potential inclusion on the WFD priority list. Therefore propose that it is not a current priority for EQS development but will review based on the outcomes of the two initiatives noted above Not a current priority for EQS development
EDTA sodium salt (Ethylenediaminetetraacetic acid tetrasodium salt)	10378-23-1	see above	see above	see above	See EDTA	As above
Emamectin					No data was located in relation to emamectin however see blelow for data on the salt emamectin benzoate	
Emamectin benzoate	137512-74-4	Insufficient info	4	Insufficient info	*Exposure* - insecticide used as a vet med in aquaculture to treat ectoparasites. No indication of tonnage used. No monit data available. Insufficient data to get overall exposure score. *Hazard* - limited data. Half life data for water only for hydrolysis and photolysis. Photolysis indicates no classif but hydrolysis vP. Half lives in sed predicted to give HP. Based assessment on sed data as rapidly adsorbed and no biodeg data for water. BCF does not indicate classif but Log Kow indicates HB. Acute and chronic tox data indicates vHT. Overall hazard classif is HP,HB and HT which gives 4.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Enrofloxacin	93106-60-6	0	Insufficient info	Insufficient info	***Exposure*** - veterinary medicine (antibiotic). Used to treat for example, dogs, cats, cattle, pigs. Vet med review notes 0.799t sold in UK in 2000 through vet wholesalers. Gives a usage score of 0. No monitoring data available. Overall exposure score therefore 0. ***Hazard*** - very limited data available. Only persistence half lives available related to photolysis. Insufficient data to make an assessment. Log Kow and BCF data suggest not classified under bioaccumulation. Toxicity data indicate T or HT (based on a study on Ecotox). However overall classification of 'Insufficient info' as insufficient persistence data available to make an assessment.	
Epichlorohydrin	106-89-8	Insufficient info	0	Insufficient info	***Exposure*** - chemical intermediate in manuf of a range of substances eg resins, surfactants, dyestuffs, pharms, adhesives. No data on tonnage/use. No monit data. Overall exposure score therefore 'Insufficient info'. ***Hazard*** - limited data set. Half life data in water available for volatilisation and hydrolysis - both thought to be key processes - do not indicate classification. No sediment data. Ready biodeg data variable - some studies indicate yes others no. Worst case vP based on not readily biodeg. Log Kow and BCF data suggest no classification re: bioaccumulation. Acute tox and ED data indicate no classification re: toxicity. Overall hazard classification of vP which gives a score of 0.	
Erythromycin	114-07-8	2	3	2	***Exposure*** - is a human pharm (antibiotic) and vet med (antibiotic). No info on vet usage but human pharm review notes 67.7 tonnes sold per annum. Gives a use score of 2. Included in targeted monit programme for human pharms - detected downstream of 3 of the STW - gives a monit score of 1 as in 2 Regions. Gives overall exposure score of 2 based on tonnage. ***Hazard*** - very limited data. Hydrolysis data is	It's use as a human pharmaceutical gives potential for exposure in the aquatic environment via STW. A limited monitoring programme has shown detection downstream of 3 STW which suggests entry to the environment. Data on hazard is very limited with the only persistence data located being for hydrolysis. No BCF data was located and only limited toxicity studies.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					the only half life data available for water and suggests vP (however data for other deg processes not available). No sed or ready biodeg data. No BCF but log Kow data suggest no classification under B. Avail tox data suggest HT. Hazard classification therefore vP and HT which gives a score of 3 (although based on limited data set).	- Detection in the environment indicates potential concern however due to limited hazard data propose at this stage that it is not taken forward for EQS development but reviewed as further data becomes available. Under review
Ethofumesate	26225-79-6	2	0	5	*Exposure* - Herbicide. Currently approved for use in a number of products - used mainly on beet, mangel and grassland. Included on Annex 1 of PPPD. Tonnage used is approx 68 tonnes. Gives a use score of 2. Monitoring data shows detected in approx one tenth of samples (4590 total samples) - monitored across all Regions in GW but only Anglian for SW. Detected in all Regions but no EQS. Gives a score of 2. Overall exposure score of 2 based on use and monitoring. *Hazard* - persistence data notes a wide range of half lives in water - photolysis occurs rapidly but biodeg may be slower - half lives for water and sed suggest vP as does not readily biodeg. BCF and log Kow suggest no classification under bioacc. Acute and chronic tox data suggest no classification. Therefore hazard classification as vP which gives a score of 0.	
Ethylbenzene	100-41-4	4	1	3	*Exposure* – Range of uses – mainly used in the prodn of styrene but also present in fuels, paints and solvents. Available data indicates high tonnage (although figure related to prodn) giving a score of 4. Monit data indicates widely sampled in GW and SW. Almost 14000 samples taken but only just over 800+ve detects noted and most of these related to effluents/waste. Environmental concns do not exceed the EQS. Exposure score of 2 based on monit data *Hazard* - data does not indicate bioaccumulative or persistent. Tox data suggests T.	- High tonnage and fact widely detected. Env concs generally below current EQS – high concs associated with discharges and PI. High tonnage indicates high exposure score although monit data suggests lower Low hazard. Not identified as key ED in IEH and EU reviews which have been used as the key sources for identifying EDs during this exercise however some reported studies indicating effects on sponges. As not identified in the ED reviews propose not classified as an ED at this stage but that it is reviewed as further data become available.

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Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						- Proppose to not take forward at the moment but to review as additional data becomes available, particulalry in relation to potential ED effects Under review
Fenbendazole	43210-67-9	1	Insufficient info	Insufficient info	*Exposure* - vet med (endectocide anthelmintic) - used on various animals including livestock and domestic pets. Vet med review notes approx 1t used in UK in 2000. Gives a use score of 1. No monit data available. Overall exposure score of 1. *Hazard* - no persistence or bioaccumulation data available. Limited tox data (only 2 acute studies located) - indicated not classifiable under T. Overall hazard classif however is 'Insufficient info'	
Fenchlorphos	299-84-3	1	3	3	*Exposure* - was used as a vet med, eg as a sheep dip. Not currently used as an ag or non-ag pesticide. No info on other uses. Monitored widely in GW (7 Regions) and 2 Regions for surface water. Only 1+ve detect in over 1200 samples (LOD in range 0.001 - 0.03ug/l, although majority 0.005ug/l). Detect was in GW (0.006ug/l) - no EQS exceedance. Gives a score of 1. *Hazard* - water half life data does not suggest classif under P. BCF and log Kow data indicate vB. Acute tox data indicate vHT. Overall hazard classif of vB and vHT gives 3	
Fenpropidin	67306-00-7	2	3	2	*Exposure* - fungicide. Currently approved for use in a number of products - primarily on cereal. To be reviewed under PPPD. Does not appear on HSE active list. Usage fallen consistently since 1990 - used 04 usage data which indicates a score of 2. Monitored in 4 Regions (3 for FW and 1 GW) - of 180 samples all below LOD. Gives monit score of 0. Overall exposure score of 2 based on usage.	- Is to be reviewed within Stage 3 of the PPPD. Used widely on cereal but has not been detected in Agency monitoring (179 samples) across 4 Regions (A, NE, NW and Mids). All below LOD. - A limited data set is available but suggests it is not persistent or bioaccumulative. Toxicity data is limited but indicates very high tox to algae. - As not widely detected at moment and hazard data is limited then propose not to take forward

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - water half life data suggests no classif. No sed or ready biodeg data. BCF and log Kow data indicate no classif. Acute tox data indicate vHT (based on effects on algae). Overall hazard classif of vHT which indicates 3.	for EQS development at this stage but to keep under review – particularly as review under PPD is completed. Under review
Fenpropimorph	67306-03-0	3	0	5	*Exposure* - fungicide. Currently approved for use in a number of products - primarily on cereals. To be reviewed under PPPD. Does not appear on HSE active list. High tonnage - 360t in 04. Gives a use score of 3. Monitoring data - over 8000samples taken , monitored in GW in 8 Regions and 3 Regions for surface water, only 40 +ve detects, exceeded GW threshold in 6 regions - score 2. Overall exposure score 3 based on usage. *Hazard* - limited data available. Water half life data indicates a classification of P, BCF and log Kow data indicate a classifcation of B, the available toxicity data does not indicate a classification. Overall hazard classification of P and B to give a score of 0.	
Fenthion	55-38-9	1	4	3	*Exposure* - an insecticide. No current approvals for use as a pesticide in the UK and has not been approved for inclusion on Annex 1 of the PPPDirective (due to potential effect on birds). No usage statistics available. Therefore not possible to propose a use score. Monitoring data available (18713 samples, only 12+ve detects (0.06%)) Approx half +ve detects related to STW effluent. No +ve detects in GW ,SW +ve detects all from one Region (South West) - gives a monitoring score of 1. *Hazard* - water half life suggests HP. No sed or ready biodeg data. BCF data suggests vB but log Kow suggests HB. Acute tox data suggests vHT (supported by many species). Overall	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					hazard classification is HP,vB and vHT - giving a score of 4.	
Flavomycin	11015-37-5	Insufficient info	Insufficient info	Insufficient info	*Exposure* - vet medicine (antibiotic). Vet med review notes the group of compounds to which flavomycin belongs had a usage of 20t in 2000 but no indication of what proportion of this is flavomycin. No monitoring data. Insufficient data to provide an exposure score. *Hazard* - no data available.	
Flavophospholipol	11015-37-5				*See above*	
Florfenicol	76639-94-6	Insufficient info	Insufficient info	Insufficient info	*Exposure* - vet med (antimicrobial) - used to treat livestock and fish. No specific use data in vet med review however group usage is noted as 3.4t however unknown how much of this is florfenicol. No monit data. Overall exposure score is 'Insufficient info' *Hazard* - the only persistence data was for marine sediments which indicated not persistent. No bioaccumulation data and no tox data. Overall hazard classif of 'Insufficient info'	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Flumequin	43825-25-6	Insufficient info	2	Insufficient data	*Exposure* - antibiotic - general search indicates used for veterinary treatment - mentioned in the vet med review. No tonnage data and no monit data therefore overall classification is 'Insufficient info' *Hazard* - Limited data set. Water half life data indicates volat, biodeg and hydrolysis are not thought to be key fate processes. Photolysis half life of <9d reported. Sed half life data suggests vP. No ready biodeg data. BCF and log Kow do not indicate classification under B. Limited acute tox data indicates not classifiable apart from blue green algae which indicates T. Overall hazard classification of vP and T - gives a score of 2.	
Flumethrin	69770-45-2	1	Insufficient info	Insufficient info	*Exposure* - synthetic pyrethroid insecticide. No current approvals for use on agricultural crops adn no pest usage data. Not on HSE list. Vet med - used to treat bees (was used as a sheep dip but no longer used for this purpose). Not found on list of actives to be considered under PPPD. Monitored in 8 Regions (GW) and 5 Regions (FW). Nearly 11000 samples but only 73+ve detects. Threshold exceeded in 2 Regions - score of 1. Overall exposure score of 1. *Hazard* - very limited data. No persistence data available. No BCF data, log Kow indicates vB.. Limited acute tox data indicates HT. Overall classif of 'Insufficient info' due to lack of persistence data.	
Fluroxypyr	69377-81-7	3	2	2	*Exposure* - herbicide. Approved for use in a number of products primarily cereals, maize, grassland and amenity turf. Not on HSE list. Included on Annex 1 of PPPD. Use tonnage approx 160t indicates use score of 3. Monitored widely across Regions in both GW and FW. 190+ve detected from approx 1400 samples. Detected above threshold in several Regions - monit score of 2 (no EQS). Overall exposure score of 3 due to usage.	- Used on a range of crops and has been included on Annex 1 of the PPPD. Has been detected in waters across several Regions. Average concentration detected is well below the effect concentrations reported for aquatic life. - Available hazard data is limited. Water half lives suggest P but ready biodeg data suggests vP. Toxicity data suggests T. - Under review – detected in the environment in a number of Regions and is widely used however

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - Water half life data indicates P however data indicates not readily biodegradable, ie vP. BCF and log Kow do not suggest classif under B. Toxicity data indicates T. Gives overall score of 2.	concentration detected is below the effect concentrations so propose keep a watching brief at the present time. Not currently a priority for EQS development
Flusilazole	85509-19-9	2	2	3	*Exposure* – fungicide. Approved for use in a range of products mainly for use on cereal and oilseed rape. To be reviewed under PPPD. Not on HSE active list. Usage data indicates a score of 2 (based on 04 usage data). Monitoring - over 200 samples taken mainly in FW across 4 Regions - no detects above LOD. Overall exposure score of 2 based on usage. *Hazard* - half life in water indicate no classification however half life in sed and ready biodeg data indicate vP. BCF and log Kow data do not indicate classification. Acute tox data do not indicate classification however chronic data indicates T. Overall hazard classification of vP and T which gives 2.	
Formaldehyde	50-00-0	4	0	5	*Exposure* - mainly used as a chemical intermediate for the production of resins, also used as a biocide and approved by PSD as a commodity substance as a fungicide eg soil and compost sterilant, bulb dip, mushroom houses and greenhouses and also as an insecticide in buildings of historical interest. Data indicates high tonnage used - giving a score of 4. Some reported use at fish farms. Monit data shows a number of samples (approx 1000) incl surface water across 5 Regions. Sampling often in relation to fish farms. Over 400 +ve detects, AA exceeded in 5 Regions and MAC in 4 Regions. Gives a score of 4. Overall exposure score of 4 based on use and monit. *Hazard* - available data indicates no	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					classification with respect to persistence based on water half lives and ready biodeg data. Log Kow and BCF data suggest no classification under bioaccumulation. Toxicity data suggests no classification. Overall hazard classification of 0	
Furans (PCDFs)	136677-10-6	Insufficient info	4	Insufficient info	*Exposure* - not manufactured commercially and no known uses other than limited use in laboratory testing. Generally present in the environment as a by-product from incineration etc. No usage data therefore. No monitoring data. Overall exposure score therefore 'Insufficient info'. *Hazard* - data for individual furans indicates vP, vB and vHT - giving a hazard score of 4.	
Galaxolide (1,3,4,6,7,8-hexahydro-4,6,6,7,8,8-hexamethylindeno[5,6-c]pyran)	1222-05-5	3	3	2	*Exposure* - polycyclic musk - fragrance used widely in personal care and household products. CSF and OSPAR listed. Tonnage data available for 2000 - gives a use score of 3. No monitoring data available. Overall exposure score is 3 based on use. *Hazard* - persistence data varies. Hera risk assessment estimates half life of 150d in water but OSPAR notes half lives in order of days. Sediment half lives estimated as 180d in Hera but 79d by Ospar. However all data agrees that not readily biodeg, ie vP. BCF data suggest B but log Kow suggests vB. Acute and chronic tox data suggest T. Overall hazard classification therefore vP, vB and T - 4 (However see review notes)	Is a fragrance used in a wide range of products – therefore potential to get into the environment. No UK monitoring data – data in HERA assessment summarises monitoring data from a range of countries – detected widely but in relatively low concns – median concn in surface water reported as 0.095ug/l. Hera risk assessment supports fact BCF is lower and use the BCF rather than log Kow value. These results in hazard score of 3 not 4 and gives overall priority ranking of 2 not 1. Monitored concns below the reported toxic concentrations. Hera risk assessment does not identify any potential risks. Await the ESR risk assessment before decisions are made.
Glyphosate	1071-83-6	4	2	2	*Exposure* – Herbicide which is approved for use in the UK on a wide range of crops, on grassland, hard standings and in aquatic situations. Has been included on Annex 1 of the PPPD. CSL usage stats indicate high tonnage giving a score of 4. Monit data available. Approx 4000 samples taken across a number of Regions in both surface and groundwater. Detected in SW and GW. Detected in more than	Under review High tonnage and wide usage. Detected widely in environment but no EQS for comparison. Concentrations below reported effect concentrations. Although has not been classified as ED in the IEH and EU review recent papers suggesting potential ED substance proposed for EQS development due to high usage, presence in the environment and

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Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					2 Regions which gives an exposure score of 2 (no EQS) Generally detected at concns <1ug/l.. Hazard – persistence data suggests vP as not readily biodegradable. BCF and log Kow data indicate not classifiable in terms of bioaccumulation. Toxicity data suggests T. Not classified as ED in the IEH and EU reviews however some papers located which suggest ED. Hazard classification of vP and T which gives a score of 2	potential endocrine effect Priority for EQS development
Heptachlor epoxide	1024-57-3	2	3	2	Exposure - no use data. Monit data - detected widely in GW (7 Regions) – 2. Detected in low concns). Hazard - data indicates P, vB and vHT - 3	- No use data was located however it is formed in the environment on the release of heptachlor, ie it is not commercially produced but occurs as a result of chemical and biological transformation of heptachlor in the environment. Heptachlor, an insecticide has been banned from use since 1984 - Monit data indicates it is detected widely in GW however based on the above is likely to be from previous use of heptachlor - Hazard data indicates cause for concern - As a transformation product of heptachlor in the environment and no known commercial sources suggest not a priority for EQS development at the moment. Not currently a priority for EQS development
Hexabromocyclododecane	25637-99-4	4	4	1	Exposure - brominated flame retardant, used in for example polystyrene foam and textiles. CSF substance. High tonnage gives a score of 4. Limited monit data - only 6 samples - all surface water from NE Region. Only one +ve detect - gives a score of 1. Hazard - not readily biodegradable therefore vP. BCF and log Kow data indicate vB. Tox data indicate vHT. Overall hazard classif of vP,vB and vHT gives a score of 4.	- An ESR risk assessment is near completion for this chemical. It identifies potential risks to the aquatic environment from a number of sources. A risk reduction strategy is to be developed. - Limited monit data is available however RA indicates is ubiquitous in the environment and found in remote areas away from point sources. - This along with the fact it has been identified as a high hazard suggests it is a possible candidate for EQS development. - It was proposed however that whether to take forward should await results of the risk management strategy arising from the ESR.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						Under review
Hexachlorocyclopentadiene	77-47-4	3	3	2	*Exposure* - use data indicates score of 3. No monit data. *Hazard* - data indicates P, vB and vHT - 3	- Further info on use and presence in the environment was highlighted as a need before a decision on ranking could be made. - Data for log Kow and BCF was available in relation to bioaccumulation – log Kow drove the classification of vB however actual study results, ie BCFs, indicated a lower potential to bioaccumulate. Propose to base on the experimental BCFs rather than the predictive log Kow which gives a bioaccumulation score of B. This does not however affect the overall hazard score. - Draft ESR indicates no need for additional testing or risk reduction measures. - Await final ESR and also determine additional exposure data before deciding whether to propose for EQS development. Under review
Hexachloroethane	67-72-1	Insufficient info	2	Insufficient info	*Exposure* - no use data. No monit data. *Hazard* - data indicate B and T - 2	
Hexamethyldisiloxane	107-46-0	Insufficient info	2	Insufficient info	*Exposure* - no use or monit data. *Hazard* - data indicate B & T - 2	

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Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Ibuprofen	15687-27-1	2	0	5	**Exposure** - a human analgaesic however no info available on quantities used. No routine monitoring data however data from targeted monitoring programme. Showed detected in all downstream samples at the 5 sites studied. Detected at concns in range of 0.414 - 5.044ug/l. Sampling points in two Regions therefore gives a monit score of 2. Concs detected do not exceeded calculated PNEC. Overall exposure score of 2 based on limited monit data. **Hazard** - limited data available. Water half life data indicates no classif and that biodeg is the main process. No sed data and no ready biodeg data. BCF and log Kow data indicate no classification. Tox data (acute and chronic) indicate no classif and no ED data. Gives an overall hazard score of 0.	
Ioxynil	1689-83-4	2	2	3	**Exposure** - use data indicates score of 2. Monit data - AA not exceeded but MAC exceeded in one unspecified sample. Score of 3 if that exceedance used otherwise a 2. **Hazard** - data given suggests HT - a score of 2.	
Isopropylbenzene	98-82-8	4	1	3	**Exposure** - use score of 4. Monit data - limited and mainly unspecified and pollution incidents. LT PNEC exceeded in 1 Region which indicates 3 but not detected widely. Use score is higher however and drives overall exposure score. **Hazard** - data given suggests T - 1	
Ivermectin	70288-86-7	1	Insufficient info	Insufficient info	**Exposure** - use data available - low tonnage - 1. No monit data. **Hazard** - no persistence data. Bioacc and tox data indicate B and vHT	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Kepone (Chlordecone)	143-50-0	0	4	5	*Exposure* - was used as an insecticide. Banned from use in UK in 1977. Did not find any data suggesting other uses. (Potentially still used/produced in some developing countries). Is noted as being a degradation product of Mirex but this is also a banned substance. Identified as a POP which will ban/restrict its use. Ban on use indicates use score of 0. No monitoring data available. Overall exposure score of 0. *Hazard* - no half lives in water given but data indicates not expected to undergo abiotic or biotic degradation to a significant extent. Sed half lives of >1year noted. Not expected to readily biodegrade. Indicates vP. BCF and log Kow data suggest vB. Acute and chronic toxicity data indicate HT also noted as an ED (HT). Overall hazard classification vP, vB,HT - score of 4.	
Levamisole	14769-73-4	0	Insufficient info	Insufficient info	*Exposure* - veterinary medicine (endectocide anthelmintic) used to treat cattle and sheep. Tonnage data in vet med review notes 0.9t Gives a use score of 0. No monitoring data available. Overall exposure score of 0. *Hazard* - no hazard data located	
Lido/ligocaine hydrochloride	73-78-9 (lidocaine)	0	Insufficient info	Insufficient info	*Exposure* - veterinary medicine (anaesthetic) - used to treat eg cats, dogs, horses. Vet med review notes use in 2000 as 0.166t. Gives use score of 0. No monitoring data. Overall use score of 0 based on use. *Hazard* - no persistence or toxicity data located. One ref to a log Kow - suggests not classifiable but a predicted value. Overall classification is 'Insufficient information'	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Lincomycin	154-21-2	0	Insufficient info	Insufficient info	*Exposure* - veterinary medicine (antibiotic). Used to treat range of orgs eg cattle, pigs, dogs, cats, poultry. Vet med review notes use in 2000 as 0.721t. Usage score of 0. Monitoring data - analysed for in GW in Mids, NE, NW but all 'less than' results (16 samples). Gives a score of 0. Overall exposure score of 0 based on use and monitoring. *Hazard* - no persistence or bioacc data located. One tox study reported in vet med review - acute study on daphnia - indicated no classification. Overall hazard classification however of 'Insufficient info'	
Lofepramine	23047-25-8	0	Insufficient info	Insufficient info	*Exposure* - human pharmaceutical (antidepressant). No tonnage data available. No monitoring data (included in targeted monit of human pharm project but not detected with LOD of ,10ng/l). Overall exposure score is 0. *Hazard* - No persistence or toxicity data located. A log Kow value was located of 7.3 which indicates vB. However due to limited data overall hazard classification is 'Insufficient info'	
Maduramicin	84878-61-5	Insufficient info	Insufficient info	Insufficient info	*Exposure* - vet med (primarily a coccidiostat in poultry) - no specific tonnage info. Vet med review notes group as a whole was 66t however no indication of what proportion of this was maduramicin. No monitoring data. Overall use score of 'Insufficient info' *Hazard* - limited data available. No persistence data. Log Kow data incidate no classification. Acute tox tests indicate no classification. Overall hazard classification of 'Insufficient info' as no persistence data.	
Malachite Green	569-64-2	3	2	2	*Exposure* - use data show low tonnage therefore score of 0. Monit data available but mainly related to discharges and aquaculture. Detected in freshwater in Midlands – levels exceed AA and MAC which would give a score of 3. *Hazard* - limited data, particularly persistence	Malachite green is primarily used at fish farms. Monitored widely and specifically in relation to fish farms however only detected in surface waters in one Region but at relatively high levels. - Hazard data indicates high toxicity. - Due to limited detections in the environment and restricted use propose as not a priority for

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					data. Tox data indicate HT	EQS development at the present time. Not currently a priority for EQS development
Mancozeb	8018-01-7	4	3	1	*Exposure* – Fungicide – approved for use in UK on a range of crops including potato, oilseed rape, barley, apple and lettuce. Included on Annex 1 of PPPD. CSL usage stats for 2004 indicate use score of 4 based on tonnage used - 4. No monit data available. *Hazard* - toxicity suggest HT. Ready biodeg indicates vP but issue of other routes of deg. Log Kow and BCF do not suggest classif with respect to bioaccumulation. Hazard classification of vP and HT gives score of 3.	- High tonnage and wide usage. No monit data - Toxicity suggests HT - Ready biodeg suggests vP however other routes of degradation appear key eg hydrolysis which suggests use of ready biodeg data may overestimate persistence - Monit data identified as a gap and mancozeb has been put forward for inclusion in the TRBM monit programme - High usage, direct release to the environment and high toxicity indicate possible candidate for EQS development. However propose to wait until monit data becomes available and review at that stage. - Also would need to review data on persistence to determine key loss processes - Therefore propose to gather further data and review when available.
Maneb	12427-38-2	1	2	4	*Exposure* - use data - big difference between average usage and 04. Trend data suggests lower figures therefore use 04 data which gives a value of 1. No monit data. *Hazard* - data suggests HT - 2	Under review
MCPA (4-Chloro-2-methylphenoxyacetic acid)	94-74-6	3	3	2	*Exposure* – MCPA is a herbicide. Currently approved for use in UK on range of cereals on grassland, amenity turf, lawns and hard standings. Also included on Annex 1 of PPPD. CSL pesticide usage stats for 04 indicated a tonnage use score of 3. Monitoring data show large number of samples – approx 25000 – across many Regions for SW and GW. EQS available – with bandings for pH above and below pH 7. Positive detections (approx 3500, 14%) in surface water in a number of Regions –	- High usage and frequently detected in the environment across E&W although levels generally well below the EQS. A few EQS exceedances which results in a score of 3 however these are relatively few compared to the number of samples and relate to comparison with the Annual Average which is not directly relevant for one off sample results. In addition the AA is that for the EQS for waters of pH<7. The EQS for pH>7 was thought to be most appropriate comparison generally in terms

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					very few GW detections. Although high concentrations detected in waste and effluent the environmental concentrations were generally well below the available EQS although a few samples showed results which exceeded the Annual Average EQS for waters of pH<7. This gives a score of 3. *Hazard* - ready biodeg suggests vP but water half lives suggest P and that other degradation processes are key. Inclusion of plant data gives a tox score of HT - 2. This gives a hazard score of 3	of surface waters but surface water values did not exceed the EQS for this. - High hazard score due to toxicity to plants/algae. - Although of high usage the concentrations detected in surface water do not indicate significant exceedance of the EQS. Therefore although noted as of high hazard to aquatic plants due to potential low exposure propose not to be considered for EQS development at this time but to review as additional data become available Not currently a priority for EQS development
MCPB	94-81-5	2	0	5	*Exposure* - herbicide, currently approved in a number of products primarily for use on cereals on grassland but also on some veg and fruit. Included on Annex 1 of PPD. Not on HSE active list. Known use tonnage gives a score of 2. Monitoring data - sampled in FW and GW in all regions. Approx 400 detected from over 15000 samples - most detected in sewage. No EQS - score of 2. Overall exposure score 2 based on use and monitoring. *Hazard* - available persistence data indicates no classification as P in terms of water and sediment half life data. Ready biodeg study not available. BCF data indicates no classification although one of the Log Kow values indicates B. Acute and chronic data generally indicate no classif as T. Overall hazard classification of 0	
Mefenamic acid	61-68-7	2	Insufficient info	Insufficient info	*Exposure* - human pharm (antiinflammatory pain killer). No tonnage data. Included in targeted monit programme for human pharms. Detected at all of the 5 sites studied at concns in range 62-366ng/l (LOD <50ng/l). Sampling sites in 2 Regions - limited data gives an exposure score of 2. *Hazard* - no data located. Overall hazard score 'Insufficient info'	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Metaldehyde	9002-91-9	3	0	5	*Exposure* - molluscicide approved for use in a range of products. Approved for use on a range of edible and non-edible crops and non crop areas. To be reviewed under PPPD. Not on list of HSE actives. Tonnage data indicates score of 3. No monitoring data available. Overall exposure score therefore 3 based on use. *Hazard* - limited data available. Hydrolysis and photolysis data suggest vP. Haven't been able to verify the sediment and ready biodeg data but suggests vP. BCF and Log Kow suggests not classified as B. Tox data generally indicates not classified. Data suggests overall hazard classif of vP which gives a score of 0 however based on limited data.	
Metamitron	41394-05-2	3	2	1	*Exposure* - herbicide, currently approved in a number of products primarily for use on beet and mangel. To be reviewed under PPPD. Tonnage data (04) indicates a score of 3. No monitoring data. Overall exposure score is 3 based on use. *Hazard* - limited data available and sometimes conflicting. Water half life data suggests no classification. One source suggests ready biodeg and another not - worst classif of vP. BCF and Log Kow suggests no classif as B. Some acute tox data suggest T. Gives a hazard score of 2.	- Usage data suggests relatively high usage however no monitoring data. - Limited hazard data set. Water half life data suggests some ready biodeg data suggests vP. The worst case situation was taken to assign the hazard score. - As no monitoring data available and the limited hazard data set propose not considered for EQS development at this stage but that it is reviewed as further data become available. Not currently a priority for EQS development
Metazachlor	67129-08-2	3	3	2	*Exposure* – Herbicide approved for use in the UK on a range of crops incl vegetables, fruits, oilseed rape, forestry. Not yet reviewed under PPPD. CSL usage stats for 2004 indicate use score of 3. Monitored across a number of Regions in GW – SW data only for Anglian. Approx 4500 samples with approx 700 +ve detects. Gives a score of 2 (no EQS) Overall exposure score of 3 – due to use. *Hazard* – limited data on persistence. Indicates P. Tox to plants/algae indicates HT. Log Kow does not indicate classification under bioaccumulation. P and HT gives an overall	- Usage data suggests high tonnage and wide usage. Widely detected but no EQS with which to compare data - Hazard data indicates high toxicity to algae/plants - Concs detected below effect concns - Although of high usage and high toxicity as monit data indicate detected in the environment at concentrations below those of concern propose that at this stage is not a priority for EQS development but is reviewed as additional data become available. Not currently a priority for EQS development

Prioritising chemicals for standard derivation under Annex VIII of the Water Framework Directive

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					hazard score of 3	
Methamidophos	10265-92-6	Insufficient info	3	Insufficient info	*Exposure* - no usage or monit data. *Hazard* - data given suggests vP and vHT	
Methane	74-82-8	1	Insufficient info	Insufficient info	*Exposure* - no usage data. Monit data – NW Region - mainly detected in groundwater and waste sites with some freshwater - 1. *Hazard* - no toxicity data therefore 'Insufficient info'.	
Methiocarb	2032-65-7	3	3	2	*Exposure* – Methiocarb is an insecticide/fungicde currently approved for use in the UK on a wide range of crops including many cereals and vegetables and strawberries. CSL usage stats for 2004 indicate a use score of 2. Available monitoring data indicate that it has been monitored in surface water in 4 Regions and in groundwater in 2 Regions. Of the approx 1300 samples there were only 6+ve detects – 2 in GW and 4 in SW – all +ve detects were in Anglian Region. The concentrations detected were all above the AA EQS – however the SW levels were not above the reporting threshold. This gives an exposure score based on monit of 3. (The remaining samples showed concentrations below the LOD which was in the range 0.005-0.05ug/l for GW and 0.025 – 0.1ug/l for SW. *Hazard* – water half life data indicate it does not meet the persistence criteria. No clear ready biodeg data. Sediment data suggest possibly P using worst case data. BCF and Log Kow data indicate does not meet the bioaccumulation criteria. Available acute and chronic toxcity data suggest vHT – 3. Overall hazard classification of P and vHT which gives a hazard score of 3	- Usage data indicates moderate tonnage. The monit data indicates very few detections – with detections only in Anglian Region. The concentrations detected however were above the AA EQS. - The LOD for methiocarb was above the AA EQS value in the majority of cases - Hazard indicates vHT. - Although +ve detections were few due to the fact the concentrations detected were above the AA EQS and the LOD was above the AA EQS, and the potential hazard posed and the use of the chemical which results in direct release to the environment it is proposed for EQS development Priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Methoxychlor	72-43-5	1	3	3	*Exposure* - no use data. Limited monit data - no SW data, 1 Region detected in GW - 1. *Hazard* - data indicate vP, B and vHT - 3	
Methyl bromide	74-83-9	3	2	2	*Exposure* - insecticide and soil steriliant. Use banned under Montreal Protocol after December 2004 except for critical uses. In UK products still approved for use in food storage but also for some crops - 167t used in 04. To be reviewed under PPPD. Gives a use score of 3. Limited monitoring data - 11 samples but mainly waste - all less than values. Overall exposure score of 3 *Hazard* - persistence data for water notes volatilisation and hydrolysis main degradation routes - not thought to biodegrade. Volat half lives in the order of hours to a few days and hydrolysis in approx 20-75 days. Classif of vP. Not ready biodeg - vP. BCF and log Kow do not indicate classif as B. Acute and chronic tox indicate T. (Classified as Grp 3 in terms of ED for wildlife therefore not given a score for ED). Overall hazard classification of vP and T giving an overall score of 2.	- Use of methyl bromide is banned under the EC Regulation on ozone depleting substances. However it is still approved by PSD for some critical uses. These include food storage and some crops eg strawberries and raspberries. Use data drove the exposure score – however the most recent data available was for 2004. This is when the restrictions came into effect with existing stocks being able to be used until end of 2005. The usage data may not be a true reflection of current tonnage used. - In terms of hazard is classified as vP due to fact not ready biodeg however this may be overestimate as is a gas and will volatilise. Not thought to be bioaccumulative and only toxic. - As subject to restrictions, the use data may not reflect current situation, persistence may be overestimated in water and the fact is a gas which may minimise entry to water then propose at this stage is not proposed for EQS development.
						Not currently a priority for EQS development
Mevinphos	7786-34-7	4	3	1	*Exposure* - no tonnage data but not used or manuf in UK. Monit data indicates exceedance of MAC in 3 Regions - 4. *Hazard* - data vHT – giving a score of 3	- Insecticide/acaricide. No usage data available – only pest stats were for 1990. No products containing mevinphos currently approved for use in UK (PSD or HSE). Not supported under PPPD. - Monit data indicates detection in groundwater and surface water with exceedances of MAC occurring in 3 Regions. Exceedances currently under investigation in Midlands to identify potential source - Hazard – data indicates vHT - As not currently approved for use in UK proposed as not a priority for EQS development *(however watching brief based on findings from*

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						EQS exceedance investigations) Not currently a priority for EQS development
Mirex	2385-85-5	Insufficient info	4	Insufficient info	*Exposure* - no use data and no monit data. *Hazard* - vP, vB and HT - 4	
Monensin	17090-79-8	Insufficient info	3	Insufficient info	*Exposure* - vet med (growth promoter, coccidiostat) used to treat for example poultry and cattle. No specific use data but vet med review notes group usage of 28t but unclear what proportion of this is monensin. Therefore insuff dat for a use score. No monitoring data. Overall exposure score therefore 'Insufficient info' *Hazard* - very limited data available. Very limited persistence data - photolysis data indicated a classification of P. Log Kow indicates vB although BCF low. Acute tox data suggests T. Overall score of P, vB and T gives a score of 3 (but based on limited data)	
Monolinuron	1746-81-2	2	3	2	*Exposure* - use data indicates score of 0. Low recent usage as withdrawn from Annex 1inclusion under PPPD. Monit data avail - 3 Regions (GW) and 2 Regions (SW), no EQS/PNEC – detected in GW in 3 Regions therefore a score of 2. *Hazard* - data indicate P, algal tox data suggests HT- 0	- Monolinuron is a herbicide however there are currently no approved ag pesticides containing this active for use in the UK. It has not been included on Annex 1 and therefore it can not be used as a plant protection product in the EU. - Large number of samples analysed for monolinuron (approx 5000) however only a few showed positive detections. - Hazard data indicated high toxicity to algae but low toxicity to other species - Due to fact there are currently no approved ag products in the UK and not included on Annex 1 propose that it is not a priority for EQS development at this time

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						Not currently a priority for EQS development
Morantel	20574-50-9	1	Insufficient info	Insufficient info	*Exposure* - vet med (anthelmintic) - vet med review notes usage data of 2t in 2000 - gives a use score of 1. No monit data available. Overall exposure score of 1. *Hazard* - very limited data. No persistence data located. One ref noted for log Kow but couldn't find - suggested no classification. Two acute tox studies did not indicate classification. Insufficient data to give a hazard classification.	
MTBE (*tert*-Butyl methyl ether)	1634-04-4	4	0	5	*Exposure* – Used as an intermediate and solvent and a fuel additive. Available tonnage data indicates high use. Monitoring data shows monitored in GW in all Regions. Approx 6000 samples but relatively few +ve detections LOD of 0.5ug/l. Data shows exceedance of RAR PNEC in 2 or 3 Regions but generally associated with pollution incidents . Use score drives exposure score. *Hazard* – persistence data indicated vP. Bioaccumulation data indicates not classified. Toxicity data suggests not classified. Studies suggest potential ED however it has not been classified as an ED in the IEH and EU reviews which have been used to determine ED classification. Gives an overall hazard score of 0	- High tonnage and use pattern indicates high usage score and this drives the exposure score. Monit data considered in more detail as a result of review. Although monitored in all Regions in GW very few +ve detections. The +ve detections generally related to effluents and also pollution incidents. Therefore although the monit data indicates exceedance of the EQS further assessment of the data suggests not relevant as not environmental concentrations - Hazard data indicates low concern overall - although study suggesting potential. - Propose not to consider for EQS development at the moment due to limited detection in the environment and low hazard but that should keep a watching brief in terms of potential ED effects - A key concern of MTBE is tainting of drinking water and fish flesh which occurs at low levels - much lower than concs at which tox is observed. The current EQS derivation procedure would not pick this issue up and therefore it would not be reflected in the EQS proposed. However this issue needs to be flagged for awareness

Prioritising chemicals for standard derivation under Annex VIII of the Water Framework Directive

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						Not a current priority for EQS development
Musk xylene	81-15-2	1	4	3	*Exposure* - use score of 1 based on limited tonnage. No monit data. *Hazard* - vP, HB, HT - 4	
N,N'-ethylenebis(4,5,6,7-tetrabromophthalimide)	32588-76-4	3	4	1	*Exposure* - used as a flame retardant in a range of products. Brominated flame retardant - CSF substance - included in EA review of flame retardants. Tonnage data indicates use score of 3. No monitoring data available. Overall exposure score 3 - based on use data. *Hazard* - limited data. Hydrolysis half lives suggest vP - no data on other deg routes but ready biodeg study suggest vP. BCF suggest no classif as B but log Kow suggests vB (although high log Kow molecule size and low solubility is not thought to cause bioacc). Possible B. Limited toxicity data but data available suggests no classif under tox. Hazard classification indicates vP and vB which gives a score of 4.	- Potential diffuse input to the environment due to its use. - Only one toxicity study the quality of which was questioned as part of the EU PBT review and there was some question over the issue of bioaccumulation. The log Kow indicated very high bioaccumulation but this was an estimated value. A BCF suggested not bioaccumulative but the quality of the study was questioned (again in the UK PBT review). Suggestion that although may be taken up may be rapidly eliminated and therefore not bioaccumulate. - Due to uncertainty around hazard data propose not to take forward at this stage and to review as additional data becomes available.. Under review
N,N'-ethylenedi(stearamide)	110-30-5	Insufficient info	Insufficient info	Insufficient info	*Exposure* - indication of type of use, ie synthetic wax - plastics lubricant, defoamer and heat stabiliser but no indication of quantities. CSF chemical - under miscellaneous subs. No monitoring data. 'Insufficient data' to give an exposure score. *Hazard* - no hazard data located apart from indication that it is not readily biodegraded. Hazard classif therefore of 'Insufficient info'	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Neodecanoic acid, ethenyl ester	51000-52-3	Insufficient info	4	Insufficient info	*Exposure* - no use or monit data. *Hazard* - vP, vB and HT - 4	
Neomycin	1404-04-2	0 (but info only avail for vet med use)	Insufficient info	Insufficient info	*Exposure* - antibiotic used as vet med and human pharm. Specific usage as vet med noted as approx 1t in 2000. No usage data in relation to its use as a human pharm. No monitoring data available. Overall exposure score of 0 based on use as a vet med. *Hazard* - very limited data. No data on persistence or bioaccumulation. Acute study on Crassostrea noted no classification. 'Insufficient info' to determine a classification.	
Nicarbazin	330-95-0	Insufficient info	Insufficient info	Insufficient info	*Exposure* - vet medicince (coccidiostat) - mainly used on poultry. No specific use data. Vet med review notes 66 t of coccidiostats sold in 2000 but no indication of relative proportion of nicarbazin. No use score possible. No monitoring data available. Overall exposure score 'Insufficient info' *Hazard* - very limited data. One data point indcated vP. No bioaccumulation data. Avail acute tox data suggested not classified. As no bioacc data not possible to give a hazard score.	
Nifurazolidon		Insufficient info	2	Insufficient info	*Exposure* - no use or monit data. *Hazard* - data indicates HT - 2	
Nitrilotriacetic acid (NTA)	139-13-9	4	0	5	*Exposure* - use data indicates score of 4 - high tonnage. No monit data. *Hazard* - data indicate no classification - 0	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Nitrofen	1836-75-5	0	4	5	**Exposure** - was used as a herbicide however use banned in UK since 1988 and not used in EU. Not included on Annex 1 of PPPD. No data suggesting other uses located. Use score of 0. No monitoring data available. Overall exposure score of 0 based on use. **Hazard** - Limited data available. Persistence data for water unclear as to classification - limited data. No sediment data. Not thought to be ready biodeg therefore score of vP. BCF indicate HB and log Kow vB which gives bioaccumulation score of vB. Acute data gives score of HT. (Classified as Grp 3 in terms of ED for wildlife therefore not assigned HT). Overall hazard classif of vP, vB and HT giving a score of 4.	
Nitroxynil	1689-89-0	0	Insufficient info	Insufficient info	**Exposure** - vet medicine (endectocide anthelmintic). Quantity sold in UK in 2000 0.684t. Gives use score of 0. No monitoring data. Overall exposure score therefore 0 based on use. **Hazard** - no data available. Overall hazard score 'Insufficient info'	
Nonylphenol ethoxylates	N/A	4	3	1	**Exposure** - use data indicate score of 4 - high tonnage (altho data from 1993 and may no longer reflect current usage due to restrictions). Monit data - detected in 6 Regions (SW) - potential exceedance of EQS but chain length unknown therefore comparison difficult. However usage score outweighs and drives exposure score **Hazard** - data indicate B and HT (due to ED) - gives a score of 3	- Use data indicated high tonnage however this data was from 1993 and there have extensive restrictions on use since then, which may have affected tonnage. - Monit data shows detection in SW but comparison with EQS is complicated by need to know chain length - Hazard info suggests moderate concern (B and HT) - Proposal is for not a priority for EQS development – controls in place and main concern is the degradation product nonyl phenol for which an EQS is being developed Not a priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Octamethylcyclotetrasiloxane	556-67-2	Insufficient info	Insufficient info	Insufficient info	**Exposure** - This cmpd has been identified as one of a number of siloxanes to be considered under ACHS. Use information was noted in minutes from an ACHS meeting - widespread dispersive use as a chemical intermediate in the production of silicone polymers. No use quantity info available. No monitoring data available. Insufficient info available to propose an exposure score. **Hazard** - Limited data available. In terms of persistence volatilisation data only available for water half life - this indicates no classification, however further data ideally required. Sed data indicates no degradation in 42days however not possible to classify using criteria. Statement is resistant to biodeg but no further details therefore can't assess whether it meets the criteria. Persistence data insufficient to determine a classification. Log Kow and BCF values indicate vB. Acute data suggest no classif but chronic data suggest HT (big difference between acute and chronic data). However due to limited persistence data it is not possible to assign a hazard score	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Octylphenol ethoxylates		3	1	3	*Exposure* - used as surfactant in eg. paints, agrochemicals, emulsion polymers and textiles. EU use figure of 1050t - gives an overall use score of 3 (Use subject to restrictions). Monitoring data - 145 samples taken (12+ve) - monitored in FW in 7 Regions, no GW data, above threshold in three Regions which gives a monit score of 2. Overall exposure score of 3 based on use data. *Hazard* - data located on persistence indicated ready biodeg - no clear water or sediment half life data. BCF and log Kow data suggest no classification. Acute and chronic tox data suggest T. Overall hazard classif of T which gives a hazard score of 1.	
Oxalate	N/A	Insufficient info	0	Insufficient info	*Exposure* - no use or monit data. *Hazard* - data seems limited - data included indicates vP - 0	
Oxolinic acid	14698-29-4	2	0	5	*Exposure* - use data indicates score of 2. No monit data. *Hazard* - data included suggest no classification	
Oxydemeton-methyl	301-12-2	0	3	5	*Exposure* - use score indicates score of 0 due to low tonnage. No monit data. *Hazard* - data provided indicates HP/vP and HT - both give a score of 3	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Oxytetracycline	6153-64-6 (CAS: 79-57-2 - other is for dihydrate form)	2	0	5	**Exposure** - veterinary and human antimicrobial. As vet med used to treat range of animals eg cattle, sheep, fish, cats and dogs. Approx 8.5t sold for vet use in 2000 and approx 34t for human use in 2000. Gives a usage score of 2. No monitoring data available. Overall exposure score of 2 based on use data. **Hazard** - limited data available. No clear persistence data - data located suggests vP. BCF and log Kow suggest no classification. Acute tox data (no chronic) indicates no classification. Overall hazard classification of vP which gives a hazard score of 0.	
Oxytetracycline chloride	N/A	2	Insufficient information	Insufficient info	**Exposure** - use score of 2. No monit data. **Hazard** - no data provided for persistence or bioaccumulation.	
Paracetamol	103-90-2	3	Insufficient info	Insufficient info	**Exposure** - human pharm (analgesic) (poss limited vet med use). Usage noted as 2000t in human pharm review. Gives a usage score of 3 (on border of classifi for 3 and 4). Monitoring data - was considered in the human pharm targeted monit work but not detected (LOD 50ng/l). Overall exposure score of 3 based on use. **Hazard** - insufficient persistence data is available to classify in terms of P. No BCF but log Kow does not suggest classification under B. Acute tox data indicates not classifiable under T (no chronic data). Due to lack of persistence data not possible to assign an overall hazard classification/score.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Paraquat	4685-14-7	2	3	2	*Exposure* - herbicide currently approved for use on a range of crops in the UK including fruit, forestry, pastureland, hard surfaces and hops. It has been included on Annex 1 of PPPD. It is not an active on the HSE list. The use quantity data may underestimate tonnage as will not include some uses eg on hard standings. Use score is 2. Monitoring data shows data primarily for surface water in Southern Region. Only 13 +ve detects out of 832 samples with only one being for surface water rather than a discharge. Gives a monit score of 1. Overall exposure score of 2. *Hazard* - persistence data is limited. Indicates photolysis, hydrolysis and volatilisation not key removal processes and is readily adsorbed to sed - no biodeg half life data. Suggests insufficient data for confident classification of persistence. If assume worst case based on the limited data indicates as vP as statement that it is not readily biodegraded. Log Kow and BCF data suggest no classif. Acute tox data indicate high toxicity to algae vHT. vHT gives a score of 3 (Persistence data wouldn't affect ie even if vP would still be a score of 3 therefore use score of 3 in assessment)	- Approved for use on a range of crops. Monitoring data indicate it has not been widely detected in surface waters. No GW data although hazard data indicates it adsorbs strongly to soil which will limit the potential to leach to groundwater. - Limited persistence data - indicates photolysis and hydrolysis are not key processes – no info on biodeg in water – suggests adsorbs rapidly and strongly to sediment but no half life data available. Found to be highly toxic. - As adsorbs strongly may of more concern in relation to sediment than water. At this stage propose not to put forward for EQS development but to review as further data becomes available. Not currently a priority for EQS development
Parathion	56-38-2	1	3	3	*Exposure* - an insecticide. No current approvals for use as a pesticide in the UK and has not been approved for inclusion on Annex 1 of PPP Directive (insuff data provided and not supported by the notifier). No usage statistics available. No use score available due to limited data. Monitoring data available (44231 samples, 50+ve detects (0.1%)) - 43 +ve detects in surface water across 6 Regions but only 4 above reporting threshold and all in Thames giving a monit score of 1. +ve detect in one GW sample in Anglian – gives a monit score of 1.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Hazard - water half life data indicate not P. BCF and log Kow data do not suggest B. Acute toxicity data suggests vHT as does chronic data. Overall hazard classification is vHT giving a score of 3.	
Parathion-methyl	298-00-0	2	3	2	*Exposure* - an insecticide. No current approvals for use as a pesticide in the UK and has not been included on Annex 1 of PPP Directive (insufficient data provided). No usage statistics available. No use score available due to limited data. Monitoring data available (24209 samples of which 22+ve detects (0.09%)). 9 +ve detects in surface water across three Regions – of which 6 exceed threshold – gives a monit score of 2. 2 GW+ve detects in 2 Regions – gives a monit score of 2. No EQS available. Therefore an exposure score of 2. *Hazard* - Limited data. Water half life data suggests P. No ready biodeg data or actual sed data. BCF suggests B and log Kow suggests no classification under B. Some acute and chronic data suggests vHT. Gives hazard classif of P and vHT which gives a score of 3.	- Parathion-methyl is not approved for use as an insecticide in the UK and has not been included on Annex 1. The exposure score was driven by monitoring data which showed detection in 3 Regions. However the overall monitoring data indicates low rate of detection in the large number of samples taken, ie only 0.09% positive detections. - Therefore although it has been detected it is infrequent and this along with the fact it is not approved for use in the UK suggest that parathion-methyl is not put forward for EQS development. Not currently a priority for EQS development
Pendimethalin	40487-42-1	4	4	1	*Exposure* – Herbicide which is approved for use in the UK on a range of crops including fruit, vegetables and cereals. It has been included on Annex 1 of the PPPD. CSL usage stats indicated use has increased over recent years. Usage stats for 2004 give a use score of 4. Monit data shows approx 3000 samples taken across 6 Regions for SW and 4 Regions for GW. 465+ve detects – all being for SW and across 3 Regions. Concentrations all below the EQS. *Hazard* – Available water half lives indicate not classified under persistence however ready biodeg studies indicate vP. BCF and log Kow indicate vB. Acute toxicity indicate vHT and chronic HT. Overall hazard classification of vP, vB and vHT giving a hazard score of 4	- Usage data indicates high use, and increasing use trends. Used on a range of crops and included on Annex 1. - Monit data indicates widespread detection in SW although concentrations below EQS. - Hazard shows high concern vP, VB and HT. - Pendimethalin was detected in a large number of surface water samples and although the concentrations were below the EQS due to high usage and indication of increasing use trends along with high hazard to the environment propose as a candidate for EQS development Priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
PFOS (Perfluorooctanyl sulphonic acid and its salts)	1763-23-1	3	3	1	*Exposure* – widely used as a flame retardant. An EU tonnage estimate gives a use score of 2. Monit data available and a PNEC. Monit data shows detection and exceedance in the environment however the available monit data is primarily in relation to the Buncefield incident and therefore does not give an indication of general levels in the environment. *Hazard* - the available hazard data indicate a hazard classification of vP, HB and T which gives a hazard score of 4	- Monit data indicates detected and at levels above the PNEC (however much of this is related to the Buncefield incident) *(Discussion at meeting however suggests evidence that widely detected in the environment)* - High hazard due to persistence, toxicity and bioaccumulation - Based on presence in the environment and posing a high hazard PFOS is proposed as a priority for EQS development Priority for EQS development
Phenmedipham	13684-63-4	2	2	3	*Exposure* - Herbicide. Large number of products approved for use in UK - primarily used on sugar and fodder beet and mangel. Included on Annex 1 of PPPD. Not on HSE list of actives. Usage score is 2. Limited monit data available - only for Anglian but from ground and surface water. Only one positive detect from 134 samples. Gives a monit score of 1. Overall exposure score of 2 based on use. *Hazard* - Water half life data indicates rapid hydrolysis and therefore no classification. However ready biodeg info gives classification of vP. BCF and log Kow data indicate no classification. Acute tox data indicates HT, chronic tox data T. Overall hazard classification therefore vP and HT giving a hazard score of 3 (would be 2 without persistence classification). (However see review comments)	- Phenmedipham is approved for use mainly on beet and mangel – is included on Annex 1. Monitoring data only for Anglian with only one +ve detection. In terms of hazard although not readily biodegradable appears to be rapidly degraded via hydrolysis therefore use of ready biodeg data to classify may over estimate persistence. Toxicity data indicates high toxicity. Based on toxicity would indicate a hazard score of 2 rather than 3 which would reduce the overall priority ranking of 3. This appears more realistic based on the data. - Propose at this stage to not take forward based on low hazard and low detection in the environment but that should be reviewed as additional data becomes available Not currently a priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Phenol, styrenated	61788-44-1	2	0	5	***Exposure*** - antioxidant used in rubber. Estimated use tonnage 400t - gives a use score of 2. No monitoring data available. Overall exposure score 2 based on usage. ***Hazard*** - Limited data available, couldn't locate EPA website ref used for the data provided. The limited data suggests vP (not ready biodeg) and B (Based on log Kow). Acute data does not suggest classification. Hazard classification is therefore vP and B which gives a score of 0 *(however based on limited data) Risk assessment underway – propose review when this data becomes available.*	
Phosmet	732-11-6	Insufficient info	3	Insufficient info	***Exposure*** - OP insecticide/acaricide - not approved for ag use in UK currently - to be reviewed under PPPD. No usage stats. Has been used as vet med - no longer used. No monitoring data available. Overall exposure score therefore 'Insufficient info' ***Hazard*** - data for half life in water notes no classification - main route of deg appears to be hydrolysis. Data for sediment notes half life of 11days - again no classification. BCF and log Kow do not indicate bioaccumulation. Toxicity data indicates vHT. vHT gives a score of 3	
Phoxime	14816-18-3	Insufficient info	3	Insufficient info	***Exposure*** - No use or monitoring data. Is an OP which has been used as an insecticide/acaricide - no ag products approved by PSD and not supported under PPPD. Not noted on HSE list of approved actives. Is also a vet med - EMEA note is used on sheep and pigs. No usage or monitoring data therefore overall exposure score of 'Insufficient info'. ***Hazard*** - Limited data on fate available. Hydrolysis data indicates P at certain pH but no other data on other deg routes located. MITI ready biodeg test suggests vP. BCF and log	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					Kow both suggest B. Acute and chronic tox data both suggest vHT. vP, B and vHT give 3.	
Piperonyl butoxide	51-03-6	Insufficient info	3	Insufficient info	**Exposure** - uses include as an insecticide synergist in ag products and vet meds as well as some human pharms (eg. lice treatments). Not on HSE list. No current usage figures. Ag data for 2002 notes <1kg which gives a usage score of 0 if based just on ag use. No monitoring data. Overall exposure score of 'Insufficient data' as although some limited use data is only for ag use and not other areas of use. **Hazard** - limited persistence data available. Stable to hydrolysis and volatilisation. Photolysis thought to occur with half lives in order of hours - although will be dependent on conditions. No biodeg data. Available data indicates no classification under P (however no biodeg data available). BCF data suggests B and log Kow data suggests HB. Acute data suggests vHT. Overall hazard score of HB and vHT - 3 (wouldn't be affected even by vP)	
Pirimicarb	23103-98-2	3	3	2	**Exposure** – Insecticide currently approved for use in the UK on a range of crops including vegetables, fruit, and some cereal. It has been included on Annex 1 of PPPD. CSL usage stats for 2004 indicate use score of 2. Available monit data indicate monitored widely in GW and in a number of Regions in relation to SW. Results show levels generally below LOD(LOD below EQS) – only +ve detections were in Southern Region where it was detected in surface water and effluents. Concentrations below EQS apart from one site where	- Moderate tonnage data but widely used. Monitored widely in GW and also some surface water monitoring – mainly detected below LOD although some +ve detects in Southern Region. Generally below the EQS although MAC exceeded at one site. - Hazard data shows very high chronic toxicity - Although toxicity data indicates it is of very high toxicity the available monitoring data indicate that although a large number of samples taken

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					exceedances of the MAC were observed. Results in an exposure score of 3 based on monitoring. *Hazard* - available water half life data indicated P for persistence however sediment half life indicated vP – no ready biodeg data. Log kow and BCF data did not indicate classification for bioaccumulation. Toxicity data indicated vHT. vP and vHT give an overall score of 3	it was not frequently detected above the LOD – in fact only positively detected in Southern Region. The LOD was below the EQS. The EQS was exceeded at one site in Southern but this was only the one site. Due to the fact it is not detected widely in the environment propose that it is not currently a piority for EQS development. Not currently a priority for EQS development
Pirimiphos-methyl	29232-93-7	2	3	2	*Exposure* - very low tonnage gives a score of 0. Monit data (GW only), no EQS exceedance, but detected in 3 Regions (GW) - 2 *Hazard* - data suggests P, B and vHT - 3	- Low tonnage. Monit data indicates detection in groundwater (very little surface water data) however number of samples showing a +ve detection is very small compared to the number of samples - Hazard data indicate very high toxicity along some persistence and potential for bioaccumulation. - Current monit data below lowest toxicity data - Although data indicates it is of high toxicity, tonnage indicates low tonnage and also infrequent detections in the environment, and therefore propose not a priority for EQS development . Data mainly for GW and would benefit from additional surface water data. Not currently a priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Poloxalene	9003-11-6	0	Insufficient info	Insufficient info	**Exposure** - vet med (enteric bloat prep) - mainly used to treat cattle. Use in 2000 was 0.118t. (Some refs that is used as a surfactant, eg in pesticide formulations however no info on whether this occurs in UK) Gives a use score of 0. No monitoring data. Overall exposure score of 0 based on use data. **Hazard** - very limited data available. Indication of not readily biodegradable (vP) - no data on water or sediment half lives. No data on bioaccumulation. No tox data - only study was effect of stress on R.trout. Insufficient hazard data to make a classification. Overall hazard classif is 'Insufficient info'	
Polychlorinated biphenyls (PCBs) (as group or if the following individual isomers indicate greater toxicity: 28, 31, 52, 101, 105, 118, 138, 153, 156, 180)	1336-36-3	3	4	1	See previous work (PCBs (Aroclors) – sheet ODS 1)	
Praziquantel	55268-74-1	Insufficient info	Insufficient info	Insufficient info	**Exposure** - no use or monit data. **Hazard** - No data	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Procaine benzylpenicillin	54-35-3	1	Insufficient info	Insufficient info	*Exposure* - vet med (antibiotic) - usage in 2000 of 2.811t. *(Some indication that used as human pharm from general search however not mentioned in pharm review)* Gives a use score of 1. No monitoring data. Overall exposure score of 1 based on use. *Hazard* - no data available (apart from a log Kow indicating no classif under B) therefore hazard classification of 'Insufficient info'	
Procaine penicillin	6130-64-9	1	Insufficient info	Insufficient info	*Exposure* - vet med (antibiotic) - used to treat a range of animals inclding cattle, horses, sheep. Use in 2000 noted as 7.223t. Gives use score of 1. No monitoring data - gives an overall exposure score of 1 based on usage. *Hazard* - no hazard data available therefore 'Insufficient use'	
Prochloraz	67747-09-5	2	3	2	*Exposure* - use data gives a score of 2 (based on recent usage data). Monit data (GW and SW with some trade discharges) - no EQS exceedances but detected in several Regions in GW and SW although not above the threshold for the latter - 2. *Hazard* - data indicates vP, B and T - 3	- Usage data indicates moderate use. - Large number of samples taken but relatively few +ve detects. Monitoring data does not indicate concns above the EQS - Hazard data indicates moderate potential concern - Data indicates not currently a priority for EQS development Not currently a priority for EQS development
Propachlor	1918-16-7	3	3	2	*Exposure* - herbicide. Approved for use in a range of ag products for use on a range of crops - primarily veg eg broccoli, brussel sprouts, cabbage, cauliflower but also oilseed rape and fodder rape. To be reviewed under PPPD. Not on HSE active list. 138t used in 04 (latest usage stats) - gives use score of 3. Monitoring data - approx 2500 samples taken across all Regions for GW and 6 Regions for FW. 12+ve detects. No EQS. Above threshold in 6 Regions in GW	- Hazard data indicates not very persistent or bioaccumulative but has very high toxicity. Is used on a range of crops – monitored widely and approx 2500 samples but very few positive detects. Concentrations detected close to effect concentrations reported for the most sensitive species ie algae which is a concern. - As few detects in environment at this stage suggest not put forward for EQS development but to review as further data become available

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					and 1 Region for FW. Gives a monit score of 2. Overall exposure score of 3 based on use. *Hazard* - biodeg thought to be key process although also undergoes photolysis and hydrolysis. Half life in water noted as 4.5 days and therefore no classif. Half life in water/sed phase noted as 84d - gives classif of P. No clear ready biodeg info. Persistence classif of P. BCF and log Kow indicate no classification. Acute tox data indicates vHT (chronic data indicates T). Overall hazard classif of P and vHT of 3	eg further monit data and also results of the review under PPPD Under review
Propanil	709-98-8	Insufficient info	3	Insufficient info	*Exposure* - no use or monit data. *Hazard* -data indicates vP and HT - 3	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Propiconazole	60207-90-1	2	3	2	**Exposure** - fungicide. Approved for use in a range of products - mainly used on cereal (barley, wheat) and grassland, oilseed rape. Included on annex 1 of PPD. Usage for 04 was approx 14t (usage gradually decreased since 1990 but stayed relatively static over last few years). Also approved for a number of non-ag uses (HSE) - approved in biocidal paints, surface biocides and wood preservatives (no indication of tonnage for these uses). Overall use score of 2 (based on ag use only). Monitoring data - nearly 6000 samples taken in FW in 4 Regions however majority of data (>5000 samples) are for Wales. 34 +ve detects in all these samples but only 7 samples above FW threshold and in 2 Regions. Gives a monit score of 2. Overall exposure score of 2 based on use and monitoring. **Hazard** - half lives in water noted as 5 and 6days Hydrolysis and photolysis half lives are longer. Water half lives suggest no classif. Water/sed half lives suggest vP. Ready biodeg data suggest vP. Log Kow and BCF data do not suggest classification. Acute tox data suggest vHT (others suggest not as high tox, ie HT) - chronic tox suggest T. Overall hazard classification vP and vHT - 3 (would be the same even if used HT rather than vHT)	- Has a range of potential uses however tonnage data is only available for the approved agricultural uses and therefore does not give true indication of overall usage. Large number of samples taken (nearly 6000) but vast majority for Wales. Only 34+ve detects with only 7 of these being above the threshold. Therefore limited detections however hazard data suggest adsorption to sediment which may affect detection in surface water. Half lives in water suggest not persistent however data for sediment suggest vP. Tox data suggests high toxicity. - Has been reviewed under PPPD and included on Annex 1– will be reviewed under BPD for some of non-ag uses. Low detection may suggest not proposed for EQS development at this stage however will need to review as further data becomes available and consider potential concern in relation to sediment Not currently a priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Propranolol	525-66-6	1	3	3	**Exposure** - human pharm (beta blocker). Usage data from human pharm review notes use of 11.8t in 2000. Gives a use score of 1. No routine monitoring data although was included in targeted monit project for human pharms. Detected in all STW effluents in range 0.093 - 0.284ug/l and in downstream samples in range 0.029 - 0.215ug/l (mean 0.04ug/l). Gives a monit score of 1 (the 5 sewage works sampled were in two Regions hence the score of 1). **Hazard** - very limited data available. The only persistence data was a water half life value of 16.8d indicating no classification under P (however the quoted ref wasn't able to be checked). No BCF data but the log Kow suggests not classified as B. The limited acute toxicity data indicated no classification however the chronic data indicated vHT (appears to be a large difference between the acute and chronic data - the actual reference used wasn't located however). The limited vHT data suggests a hazard classification of B and vHT giving a hazard score of 3	
Propylene oxide	75-56-9	4	0	5	**Exposure** - widely used as a chemical intermediate and direct uses eg stabiliser, anticorrosion additive. High tonnage of 300000t per year (ESR data). Gives use score of 4. No monit data. Overall exposure score of 4 based on tonnage used. **Hazard** - persistence in water indicates no classif (mainly hydrolysis) however noted as not ready biodeg therefore vP. BCF and log Kow indicate not classifiable under B. Tox data (acute only) indicate no classif. Overall hazard classif of vP which gives hazard score of 0.	
Propyzamide	23950-58-5	3	2	2	**Exposure** - use data gives a score of 3. Monit data (GW, SW and PI) mainly for GW. Only monitored in SW in one Region – frequently detected in SW. No exceedances of EQS – 1 **Hazard** - data indicates HP and T gives score of	- Rlatively moderate tonnage but used over a large area on a range of crops. - Monit data is available for GW and SW although majority of data for GW. SW data only for one Region and shows frequently detected but at levels significantly below the EQS. No

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					2	+ve detects in GW - Hazard data indicates relatively low hazard. - Relatively low hazard and no exceedance of EQS suggests not currently a priority for EQS development Not currently a priority for EQS development
Resorcinol	108-46-3	4	1	3	*Exposure* - has a wide range of uses. Key use is in the production of rubber products, wood adhesives and flame retardants but also in the manuf of UV stabilisers, dyes, phenols, hair dyes, shampoos, pharmaceuticals (eg acne treatment). Tonnage consumption noted as 13500t in W. Europe in 2000 (CICAD 2006). Gives a use score of 4. No monitoring data available. *Hazard* - limited persistence data available. Thought to be readily biodegraded, no sed half life but not thought to adsorb significantly, biodeg and photolysis thought to be main deg routes - but no half lives given. Based on ready biodeg not thought to be classifiable under P. BCF and log Kow data do not suggest classif under B. Acute tox data suggest T. Gives a hazard classification of 1	
Robenidine hydrochloride	25875-50-7	Insufficient info	Insufficient info	Insufficient info	*Exposure* - vet med (coccidiostat). Used to treat various orgs eg poultry. No specific use tonnage data - vet med review notes 66t of this group of chems used but no indication of amount of this particular chemical. No monitoring data. Overall exposure score of 'Insufficient info' *Hazard* - no persistence data available. Log Kow indicates not classified under B. (No BCF data) Acute tox data indicate HT (No chronic data or ED classif). Overall hazard score of 'Insufficient data' due to lack of P info.	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Sarafloxacin	98105-99-8	Insufficient info	Insufficient info	Insufficient info	**Exposure** - no use or monitoring data. Is an antibiotic used for veterinary medicine purposes. No tonnage data for this specific chemical however data in Agency R&D review of vet meds noted that sales of the group of antibiotics to which this substance belongs was 1tonne in 1999 which suggests low tonnage use for sarafloxacin. Overall score of 'Insufficient info' however. **Hazard** - very limited data available. Water half lives only available for photodegradation which indicates rapid degradation. Half life in seds indicates vP. Toxicity data is limited. Data for some algae suggest HT. No bioaccumulation data. Therefore insufficient data.	
Sarafloxacin hydrochloride	same as above (synonym)	See above	See above	See above	See above	
Styrene	100-42-5	4	0	5	**Exposure** - High annual production and use figures result in a use score of 4. Monitoring data indicates widely detected and exceeds AA in a number of Regions - giving a score of 4. Use and monitoring data indicate score of 4. **Hazard** - Data on persistence notes undergoes biodeg and volatilisation. No photolysis or hydrolysis. Suggests classification of P if take worst case of biodegradation where volatilisation does not occur. Half life for sediment has been estimated under TGD as 300days which indicates vP - however although will adsorb to sediment - likelihood may be low due to other factors. Noted as readily biodegradable. BCF and log Kow indicate no potential to bioaccumulate. Toxicity data suggest relatively low tox - one study suggests <1mg/l which indicates T but majority of data suggest no classification. Noted as Grp 1 ED under EU review however this was primarily based on	- Based on further consideration of the available hazard data it indicates that data suggests not T and unlikely to be vP which would lower the hazard score. - The ESR risk assessment did not identify any risks from styrene in the environment taking into account production, use and disposal. This along with its relatively low hazard in the environment suggests that it should not be put forward for EQS development at this stage. However need to review as additional data becomes available – particularly in relation to potential endocrine effects on wildlife and also in light of further consideration of monitoring data as data suggested exceedance of AA – this needs to be assessed further. - The fact the ESR did not pick up any risks and that the data indicates low hazard suggests that styrene is not currently a priority for EQS development.

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					human health impacts rather than environmental which is assigned Grp 3. Overall hazard of vP and T giving a score of 2. (See review comments)	Not currently a priority for EQS development
Sulfamethoxazole	723-46-6	0	Insufficient info	Insufficient info	*Exposure* - human pharm (antibiotic). No usage data. Included in targeted monit project for human pharm - not detected in any receiving water and in only 9% of effluents. Gives a score of 0 based on limited monit data *Hazard* - very limited data. Data suggests vP based on ready biodeg data and also from a mesocosm study. No BCF data but Log Kow suggests not classifiable under B. No toxicity data located. Due to lack of tox data gives a score of 'Insufficient info'	
Sulphadiazine	68-35-9	Insufficient info	Insufficient info	Insufficient info	*Exposure* - Antibiotic used for veterinary purposes. 14.2t were sold in UK through vet wholesalers in 2000. This use info would suggest a score of 1. No monitoring data was available. Overall exposure score of 1 based on use data *Hazard* - Limited data set available. Data for sed indicates vP and ready biodeg data suggest vP. No bioaccumulation data was found. Toxicity data was limited - all indicated no classification apart from a study on M.aeruginosa which indicated T. Insufficient data as no bioaccumulation data	
Tamoxifen	10540-29-1	Insufficient info	Insufficient info	Insufficient info	*Exposure* - human pharm (Key use in treatment of breast cancer). No usage data. Included in targeted monitoring project for human pharm. No detects in receiving water - a few detects in STW effluent. Limited monit data - suggests 0 or 'Insufficient data' *Hazard* - very limited data. No persistence data located. Log Kow data point indicates vB but no BCF data. One acute tox data point suggests vHT but again only one data point and no	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					chronic info. No persistence data therefore classification as 'Insufficient info'	
Tebuconazole	107534-96-3	3	2	2	*Exposure* - fungicide. Approved for use in a number of products. Used on a range of crops including cereals and veg and oilseed rape. To be reviewed under PPPD. Ag use noted as approx 118t (2004). Also approved by HSE as a wood preservative in a number of products.To be reviewed under BPD. Use score of 3 (*based on ag usage - no non-ag data*). No monit data. Overall exposure score 3 - based on usage data *Hazard* - although undergoes photolysis half life in water noted as 365d indicating vP. No clear sed or ready biodeg data. BCF and log Kow data suggest not classified under B. Acute toxicity data indicates T (chronic and ED data suggest no classification). Overall hazard classification of vP and T - 2	- Is approved for use on a range of crops but has not yet been reviewed under PPPD. Also used as a wood preservative and will therefore be reviewed under BPD. Usage data only available for ag uses – indicate use score of 3. No monitoring data available. - Very limited persistence data but worst case data suggests vP. Not noted as bioaccumulative and in terms of toxcity classified as T. - At this stage propose not to put forward for EQS development as no information on presence in the environment and also relatively low hazard, but consider as further data becomes available and consider undertaking monitoring. Also await outcome of reviews under PPPD and BPD. Under review
Tecnazene (total)	117-18-0	1	3	3	*Exposure* - use and monitoring data available. Tecnazene is a fungicide which was used on seed potatoes. No longer approved for use in UK and not supported under PPPD. Usage score of 0 based on most recent usage info (which was 1994). Monit data available - noted no exceedance of EQS. Detected in two Regions to give score of 1 *Hazard* - limited persistence data available. Water sediment half life indicates vP. Range of BCFs - most extreme indicates vB with most HB. Log Kow suggests B. Acute toxicity data only - indicates T. Therefore vP, HB and T overall - 4	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Teflubenzuron	83121-18-0	0	4	5	**Exposure** - Used as an insecticide - currently two products approved for use in UK for use on ornamentals. Data from CSL for ag usage notes low tonnage ie 0.094t in 2004. Not yet considered under PPPD. Some vet med usage - for treatment of fish in fish farms. No usage stats for vet med uses. Limited data gives a use score of 0. No monitoring data available. Overall exposure score is 0

Hazard - limited data avail. Data on hydrolysis and photolysis available - some hydrolysis half lives suggest vP - sediment half life data suggested no classif. Log Kow value suggested HB - the BCF value found suggested no classif. Majority of tox data suggest no classif however the invertebrate study indicates vHT - no chronic data. Overall is vP, HB and vHT - 4 (based on limited data set and using worst case data) | |
| Terbutryn | 886-50-0 | 3 | 3 | 2 | **Exposure** – Terbutryn is a herbicide. Currently approved for use on beans and peas. However it has not been supported under PPPD and therefore the remaining products have been gratnted derogation for use until end of 2007. There will be some essential use approval for its use on lupins. Was used as an aquatic herbicide – this use does not fall under PPPD and was reviewed under the Biocidal Products Directive (BPD) – this use was not supported. The available use data is for 2004 – this gives a score of 3 however this may not truly reflect current usage which is likely to be less due to the forthcoming restrictions. It has been monitored widely in GW and SW with data for approx 19000 samples. Approx 1300 +ve detects(7%) in both GW and SW in a number of Regions. No EQS. Gives an exposure score of 2

Hazard – no ready biodeg data. Water half life data indicates P but sed half life data indicates vP. LogKow and BCF indicate no classification under bioaccumulation. Toxicity data indicates vHT. Gives an overall hazard classification of vP. | - Currently used as an ag herbicide however this use will cease at end of 2007 apart from essential uses due to fact active was not supported under PPPD. Was usee as an aquatic herbicide however this use has not been supported under BPD. Available tonnage data may therefore not truly reflect current tonnage – no tonnage data for use as an aq herbicide.
- It is widely detected in surface and groundwater. No EQS available for comparison. Although majority of concentrations detected are below the lowest available toxicity data some are in a similar range.
- Data indicates vHT and - some concns detected are above the toxicity data which suggests a potential concern in the absence of an EQS
- Although widely detected and of high toxicity, as its use as a pesticide is being phased out suggest not currently a priority for EQS development |

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					and vHT which gives a score of 3.	Not currently a priority for EQS development
Terphenyl	26140-60-3	Insufficient info	4	Insufficient info	**Exposure** - used as heat storage and transfer agents, textile dye carriers and intermediates in prodn of non-spreading lubricants. No tonnage data. No monit data. Overall exposure score of 'Insufficient info'. (On CSF list and OSPAR list of concern) **Hazard**- ready biodeg data indicates vP, BCF and log Kow data indicate vB, tox data indicates HT for algae. Gives overall hazard classif of vP, vB and HT, ie overall score of 4.	
Tert-dodecanethiol	25103-58-6	3	4	1	**Exposure** - CSF substance. EA have carried out a risk assessment. Prodn range in Europe is noted as 10-25kt. Used in production of emulsion polymers in various types of rubber, and in dispersions and latices used in range of uses eg adhesives and paper coatings. Use data gives a score of 3. Monitoring data is limited. Total of 6 samples reported from 2 regions but only less than values - gives a score of 0 but based on limited data. Overall exposure score of 3 based on tonnage data. **Hazard** - limited persistence data available. No water or sed half lives - ready biodeg data suggests vP. Log Kow suggests vB. Acute tox data suggests HT, chronic data T. Hazard classification is therefore vP, vB and HT - 4	- EA risk assessment indicates no UK prodn but some use. Limited monitoring data and some indication that difficulties associated with monit this chemical. RA noted some potential risks identified from TDM but primarily to sediment but that the assessment could be influenced by further information and that the current conclusions are uncertain and would need to be considered as further data becomes available. - Data on hazard was particular limited – limited data on persistence and no experimental Kow or BCF. - Due to the assessment being made on limited data, suggest that at this stage substance is not put forward for EQS development but that it is reviewed as additional data become available.
Tetrabromobisphenol A (2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol)	79-94-7	3	3	2	**Exposure** - use and tonnage data available - indicates a score of 3 using the higher tonnage prediction. No monitoring data available therefore exposure score of 3 based on usage. **Hazard** - half lives for water indicate vP, data indicates not readily biodeg ie vP. Upper end of BCFs suggest HB, log Kow suggests vB. Acute tox data indicates HT. Overall is vP, vB and HT – 4 (however see review notes)	Under review - It was noted that this is primarily used in reactive flame retardants and that a tonnage of 620t was reported in the UK. - Receipt of environmental RAR under ESR following peer review suggests lowering of hazard score to 3 due to classification as B rather than HB and as T rather than HT. - A risk assessment identified potential risk from certain uses ie in relation to sites dealing with additive flame retardant use. As a result a risk management strategy is being developed by

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
						Defra. It may be worth waiting making a decision until this management strategy has been developed. In addition TBBP is one of the chemicals put forward by EU for possible inclusion on list of priority substances and will be considered via that route. Propose hold until outcomes of the above addressed and then reconsider. Under review
Tetracycline	60-54-8	1	2	4	*Exposure* - vet med (antibiotic), human pharm (antibiotic). Vet med usage in 2000 approx 1.5t, human pharm usage in 2000 approx 5t. Use score of 1. No monit data available. Overall exposure score of 1. *Hazard* - very limited data set. For persistence only data for water half lives which indicate not classifiable. No BCF but log Kow suggests not classif. Limited tox data suggest HT based on tox to a cyanobacteria. Overall hazard score of HT, ie 2.	
Thiram	137-26-8	2	3	2	*Exposure* - fungicide. Approved for use in a number of ag products. Used on a range of crops including cereals but primarily veg eg cabbage, bean, pea, oilseed rape. Included on Annex 1. Usage noted as approx 63t. Refs that also used in rubber ind as and accelerator and vulcanising agent but no further info on this or tonnage. Use score based on ag use is 2. (Checked HSE active list but not included). No monitoring data. Overall exposure score is 2 based on use data. *Hazard* - various water half lives reported - with worst case values indicating vP, ready biodeg data also suggests vP. No data for sediment. BCF and log Kow data suggest no classification under B. Acute tox data suggest classif as vHT. Overall hazard classif of vP and vHT which gives a score of 3.	- There is an agricultural use but also a potential non-ag use however limited information on this and no clear indication of whether it is used and the quantities used. No monit data available – suggest would be useful to have some monitoring data to identify whether present in the environment before making the decision as to whether to take forward for EQS development. - Uncertainty over persistence – water half life data suggests not classified but ready biodeg suggests vP. However would not affect overall hazard score which is driven by toxicity data. - At this stage propose that further information on use and presence in the environment is needed before proposing chemical for EQS development. Under review

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Tiamulin	55297-95-5	1	Insufficient info	Insufficient info	**Exposure** - vet med (antibiotic) – tonnage in 2000 1.4t. No monit data. Overall exposure score of 1 based on tonnage used. **Hazard** - very limited data set. No persistence data. No BCF but log Kow indicates HB. Limited tox data - indicates vHT for acute aquatic cyanobacteria (no chronic or ED data). However overall hazard classif of 'Insufficient info' due to lack of persistence data.	
Tilmicosin	108050-54-0	0	Insufficient info	Insufficient info	**Exposure** - vet med (antibiotic). No specific tonnage data for this substance. Overall group noted as 3.4t but unclear how much of this is tilmicosin. Monit - 16 GW samples in 3 Regions but all below LOD. Overall exposure score of 0 based on the limited monit data. **Hazard** - very limited data available. Water half life data indicates not classifiable under P based on hydrolysis. Bioaccumulation data (BCF and log Kow) suggests not classifiable. No toxicity data located therefore overall score of 'Insufficient info'	
Toltrazuril	69004-03-1	Insufficient info	Insufficient info	Insufficient info	**Exposure** - vet med (endoparasiticide-antiprotozoal). No specific usage data (group usage 0.18t but no indicate of proportion of this that is toltrazuril). No monit data. Insufficient data to give an exposure score. **Hazard** - no data located on persistence, bioaccumulation or toxicity. Overall hazard score of 'Insufficient info'	
Toxaphene	8001-35-2	0	4	5	**Exposure** - toxaphene was used as an insecticide however its use as an ag pesticide was banned in the EU in 1984. No information indicating other uses was found. No monitoring data was located. As not used in EU indicates a score of 0. **Hazard** - Limited data. Half life data only for volatilisation which indicates vP. No other half life data but other available data supports fact is	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					very persistent. BCF indicate vB. Acute toxicity data indicate vHT. Is classified as a Grp II ED for wildlife (HT). Overall hazard classification of vP, vB and vHT, ie 4	
Triallate	2303-17-5	3	3	2	*Exposure* – herbicide - currently 2 prods approved for use on a range of crops, eg barley, pea, wheat. Not yet reviewed under PPPD. Tonnage data available for 04. Indicates a score of 3. Monitoring data available. Detected in SW and GW - monit mainly in Ang and Southern regions. 213+ve samples out of 2977. No EQS exceedance. Gives a monit score of 1. Overall exposure score driven by use and gives a score of 3 *Hazard* - limited fate data available. Half lives for photolysis, volatilisation and hydrolysis. Overall water half life reported but below criteria for classification under persistence. Log Kow and BCF data indicate HB. Acute toxicity data indicates HT. Therefore overall hazard classif of HB and HT - 3	- Used in relatively high tonnage and has been detected in surface and groundwater – monit mainly in 2 Regions. No exceedances of EQS. Has been identified as of high tox to certain species – also noted as highly bioaccumulative in some species but it's low persistence may affect this. - Possible candidate for EQS development however may put on hold until EU PPPD review complete - Propose not a priority for EQS development at the moment as not frequently detected in water and not above current EQS. However keep a watching brief as additional data becomes available and it is reviewed under PPPD. Under review
Tribromomethane	75-25-2	2	0	5	*Exposure* – has a wide range of uses including as a chemical intermediate, solvent and fire extinguisher ingredient. No tonnage data was located. Monitoring data shows approx 15000 samples for tribromomethane – however relatively few +ve detects, ie 730. Detected in SW and GW in a few Regions. No EQS. Exposure score of 2 based on available monit data. *Hazard* - limited data. Persistence data indicates volatilisation is a key process. Water half lives give a score of P. Data suggest not readily biodeg ie vP. Bioacc and tox data suggest not of concern. Overall hazard classif of vP which gives a score of 0.	- Investigate additional use and tonnage info to be able to identify source and exposure more clearly as it appears to be widely detected in ground and surface water and need to identify reason why, ie potential sources. - Effect data appears limited – need to do further review and supplement with QSAR studies if required in order to be able to further consider relevance of concns detected in the absence of an EQS. Current data available suggests large difference between concn detected and the toxicity data located but only one tox study available. - Propose not to consider for EQS development at the current time but to review as further data becomes available. Under review

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Tributyl phosphate	126-73-8	3	0	5	*Exposure* - main uses noted in SIDS review as component of aircraft hydraulic fluid and as a solvent for rare earth extraction and purification. Minor uses as defoamer additive and a carrier for fluorescent dyes. In UK apparently used by BNFL at Sellafield. No specific UK data on tonnage. EQS noted few hundred tonnes per year. SIDS note prodn vol of 3000-5000t worldwide/year. Based on few hundred tonnes gives use score of 3. Monitoring data shows 128 +ve detects out of 732 samples. Analysis in 2 Regions but only detected in SW in one Region. No exceedance of EQS. Indicates a monit score of 1. Overall exposure score of 3 based on limited use data. *Hazard* - limited data set. Persistence data indicates no classification. BCF and log Kow don't suggest classification under bioaccumulation. Acute and chronic tox data do not suggest classification. Hazard score of 0	
Tricaine methanesulfonate	886-86-2	Insufficient info	Insufficient info	Insufficient info	*Exposure* - found numerous refs on Google that this is a fish anaesthetic. One approved product noted in Noah compendium. No indication of tonnage used however. No monit data available. Insufficient data for classification however from usage not expected to be high tonnage. *Hazard* - no persistence or bioaccumulation data located. Acute tox data for fish indicate not classified. Overall is insufficient data.	
Trichlorfon	52-68-6	0	3	5	*Exposure* - OP insecticide. No currently approved products in UK - products expired in April 01. Not yet reviewed under PPPD. Data not located suggesting other uses. Indicates usage score of 0. No monitoring data available. *Hazard* - water half life data indicates no classification, BCF and log Kow data indicate no bioaccumulation classif. Acute toxicty data indicate vHT. Overall hazard vHT - 3	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Trichlorophenols	25167-82-2	2	3	2	**Exposure** – A number of chemicals fall within this group - potentially different uses. Data for 2,4,5-TCP indicates used as a chem intermediate in manuf of preservatives and pesticides and also used as a bactericide. Data for 2,4,6-TCP indicate chem intermediate in manuf of pesticides. No tonnage data available. Monitoring data available for 2,4,5-TCP and 2,4,6-TCP. 11129 samples taken for the former. 99 samples showed positive detects (0.9%). For the 2,4,6-TCP isomer 31806 samples were taken with 1835 +ve detects (5.7%). Data mainly for FW but some GW - samples across all Regions. Exceedance of SW threshold in 7 Regions which gives a monit score of 2. **Hazard** - data search for a number of isomers. Limited data available. Persistence data indicates vP. Log Kow data indicate B. Acute tox data indicates T. Overall hazard classification of vP,B and T which indicates 3.	- No tonnage data available. Number of isomers and therefore difficult to assess. Data shows extensive monit for 2 isomers but relatively low detections. Concentrations detected generally below the effect concentrations reported. - Data on hazard located for each isomer – appear to vary with one isomer getting a hazard score of 0 and another 3. - Prior to considering for EQS development need further information and clarity in terms of the isomers likely to be present and the hazards posed by those. Under review
Triclabendazole	68786-66-3	1	Insufficient info	Insufficient info	**Exposure** - vet med (endectocide anthelmintic). Tonnage used in 2000 approx. 1.3t. Monit - no data available. Overall exposure score of 1 based on tonnage. **Hazard** - no persistence data or bioaccumulation data. Limited acute tox data indicates not classifiable. Overall hazard score of 'Insufficient info'	
Triclosan	3380-34-5	4	4	1	**Exposure** – Widely used as an antibacterial agent in a range of household and personal care products. Data on tonnage indicate a score of 2. Monitored in surface water in a number of Regions – widely detected and has been detected at concentrations exceeding the long term PNEC in 5 Regions - 4. **Hazard** – bioaccumulation HB, not ready biodeg ie vP, toxicity vHT - 4.	- Although relatively low tonnage monit indicates wide detection and at levels above the proposed PNEC. - High hazard score in combination with wide detection indicates inclusion as priority for EQS development Priority for EQS development

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Trietazine	1912-26-1	2	Insufficient info	Insufficient info	*Exposure* – Herbicide – no products containing this active currently approved for use in the UK. Had not been taken forward for consideration under PPPD and therefore use is likely to cease in terms of ag use. No other indication of other uses. Most recent ag usage stats were for 2003 which indicated 0.058t. Gives a usage score of 0. Has been monitored for widely with approx 9000 samples being taken. Monitoring has occurred across all Regions for GW but only in Anglian for surface water. Of the 9000 samples – approx 600+ve detects. No EQS – gives an exposure score of 2. *Hazard* – limited data - no persistence data located. Log Kow suggests no classification for bioaccumulation (no BCF data). Limited toxicity data indicates T for data for fish. However as no persistence data overall hazard classification is 'Insufficient info'	- Relatively low usage data but detected widely primarily in groundwater. Has not been taken forward into PPP and therefore use is likely to cease in terms of agricultural use. No products currently approved in UK - Insufficient hazard data – concs detected below the concns reported to have a toxic effect – although this was based on limited data. - Although insufficient data was available to determine a priority ranking the available information suggests that use is likely to be limited and therefore not currently a priority for EQS development. Not currently a priority for EQS development
Trimethoprim	738-70-5	1	Insufficient info	Insufficient info	*Exposure* - antibiotic used in treatment of both humans and animals. Review of vet meds indicated 2.955t sold in UK in 2000 via veterinary wholesalers. Approved for use on a wide range of animals, eg cattle, pigs, horses, cats & dogs. In human pharm review notes 2782 prescriptions in UK in 1997 but no tonnage info. Available data indicates potential wide dispersive use (0.5) but relatively low tonnage - limited data indicates score of 1. No monitoring data available - wasn't included in targeted monit for human pharms. Exposure score therefore 1. *Hazard* - limited data available. Insufficient persistence data. BCF and log Kow data indicate no classification under bioacc. Very limited toxicity data - suggests no classification. Overall classification of insufficient info	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
Triphenylphosphine	603-35-0	Insufficient info	Insufficient info	Insufficient info	*Exposure* - very limited data. Indication it is a chemical intermediate, eg for pharms. No tonnage data avail. No monit data avail. Overall insufficient data. *Hazard* - very limited data set. No persistence data, log Kow value suggests HB, limited acute tox data indicated T. Insuff data due to lack of persistence data	
Tylosin	1401-69-0	1	Insufficient info	Insufficient info	*Exposure* - vet med (antibiotic). Tonnage in 2000 was approx 5t - gives a use score of 1. Monit - 16 GW samples in 3 Regions - no +ve detects ie all below LOD. *Hazard* - insufficient data to classify under persistence. BCF and log Kow data indicate no classification under B. Acute tox data suggest HT.	
Vinclozolin	50471-44-8	2	2	3	*Exposure* - fungicide. Currently approved for use in UK in a number of products. Used on apples, beans, peas, rape. However not included on Annex 1. Tonnage of 17t gives use score of 2. Monit - 204 surface water samples from 5 Regions but no +ve detects ie all below LOD. Overall exposure score 2. *Hazard* - Limited fate data indicates not classifiable under P (No ready biodeg data). BCF and log Kow data indicate no classif under B. Acute tox data indicates T, no chronic data however identified as endocrine disrupter therefore HT. Overall hazard classif of HT gives hazard score of 2 (primarily due to ED).	
Vinyl chloride (chloroethylene)	75-01-4	4	0	5	*Exposure* - chemical intermediate in the prodn of various chemicals including PVC. Very high tonnage gives use score of 4. Monit data indicates detected in surface water in 2 Regions giving a monit score of 4. Overall exposure score of 4. *Hazard* - persistence data indicates vP due to lack of ready biodegradation. BCF and log Kow	

Chemical Name	CAS No.	Exposure Score	Hazard Score	Risk Ranking	Comments	Review Comments
					do not indicate classification under B. Acute and chronic tox data do not suggest classification. Does not appear on any of ED lists, eg IEH summary, BKH). Overall hazard classif of vP which gives a hazard score of 0	

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