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PRECIOUS METALS CONSORTIUM

TENDER FOR GOLD, PLATINUM GROUP METALS AND RHENIUM REACH REGISTRATION PROJECTS

PROPOSAL FROM WCA ENVIRONMENT & BIBRA

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Proposal Manager
Dr Mark Crane
wca environment limited
23 London Street
Faringdon
Oxfordshire
SN7 7AG
UK

Tel: +44 (0)1367 244311

Email: mark.crane@wca-environment.com
Web: www.wca-environment.com

Introduction

The Precious Metals Consortium (PMC) has invited wca environment and bibra to tender for Gold, Platinum Group Metals (PGMs) and Rhenium REACH Registration projects. The three projects are based on five phases of work, as follows:

- Phase I: Literature work; data gap analysis; formal report of findings.
- Phase II: Test derogation assessments and the design and progression of any enabling tests (such as bioaccessibility determinations) relevant to Intelligent Testing Strategies and test waiving.
- Phase III: Main test programme design, test conduct, test monitoring and reporting (per REACH Annexes).
- Phase IV: Production of Chemical Safety Assessments/Chemical Safety Reports.
- Phase V: Compilation of IUCLID 5 files and Registration Dossiers.

The numbers of substances for each project are:

- Gold – 8 substances
- PGMs – 92 substances
- Rhenium – 7 substances

All the listed substances fall within 1-10 or 10-100 tonnes per year bands, and some are intermediates.

The following sections detail the type of work required for each of the five phases, described separately, where necessary, for human health and environmental components, and provide our financial offer. We also provide pen portraits for team members and describe how wca and bibra staff will work together as a team under the leadership of Dr Mark Crane and within wca's certified Quality System.

It has been recognised by the PMC that accurate costing of currently unknown quantities of work is not possible. In this proposal we therefore provide a fixed price quote for the elements in Phase I that can be estimated reasonably accurately. We then provide indicative prices for subsequent phases.

Methodology

PHASE I: LITERATURE REVIEW AND DATA GAP ANALYSIS

The output of Phase I will be a data matrix which clearly identifies tonnage-relevant IUCLID 5 endpoints for which there are no data, tonnage-relevant endpoints for which valid data potentially exist for gold, PGMs and rhenium, and any other toxicity data on these compounds that could be useful in later phases (e.g., when writing data waivers). This will help to provide a preliminary identification of data gaps and endpoints for which grouping and read-across may be possible, and will also help us to identify any appropriate reference substances on the basis of chemical, physical and biological behaviour in relation to other group members (i.e., any trends across groups). We will use experience gained through the understanding of previous metals risk assessments, undertaken through the TCNES process, to assess potential read-across conditions.

We will request and collate all relevant information currently held by members of the PMC, and the following databases will also be searched for information on physical and chemical parameters and toxicological information for mammalian and environmental receptors:

- ChemFinder.com
- Hazardous Substance Databank (HSDB)
- European Inventory of Existing Commercial Chemical Substances (EINECS)
- Toxicological Data Network (TOXNET)
- Ecotox Database (www.epa.gov.ecotox)
- European Chemicals Bureau (ECB) (www.ecb.jrc.it)
- Organisation for Economic Co-operation and Development (OECD) (www.oecd.org)
- Syracuse Research Corporation (www.syrres.com)
- Japan Existing Chemicals Database (JECDB) (http://dra4.nihs.go.jp/mhlw_data/jsp/SearchPageENG.jsp)
- Bibra's TRACE database
- Web of Science
- Google

We have performed an initial search on Toxline and the USEPA Ecotox databases to quantify the approximate number of papers and reports that would need to be screened for each substance. For reasons of member company confidentiality we cannot provide a full breakdown of this analysis here by substance, but we are able to provide an overall summary of the scale of the task.

Toxline shows that there are very large numbers of papers potentially related to mammalian toxicity for gold, PGMs and rhenium as follows:

- Gold – 1026
- PGMs – 11387
- Rhenium – 160

Most of these papers are likely not to be of use in fulfilling REACH data requirements, but it is important at least to scan the titles or abstracts to ensure that those that may be of use are identified for further evaluation in the next project Phase. The REACH Regulation puts much emphasis on the obligations on registrants to collect all available and appropriate data. To scope this Phase accurately we sampled the Toxline database to estimate the proportion of papers that could immediately be discarded on the basis of their titles, and the proportion which would require further evaluation of abstracts before a decision could be made. We found the following:

- Gold: 70% of papers can be discarded on the basis of their title and 30% require assessment of abstracts.
- PGMs: 50% of papers can be discarded on the basis of their title and 50% require assessment of abstracts.
- Rhenium: 50% of papers can be discarded on the basis of their title and 50% require assessment of abstracts.

Assessing *and recording* the results of each assessment takes on average one minute when a title is the basis for a decision and five minutes when an abstract is the basis for a decision. This leads to the following time estimates for the task:

- Gold: 38 hours (~ one staff week)
- PGMs: 569 hours (~ 15 staff weeks)

- Rhenium: 8 hours (~ 1 staff day)

A second option would be to select papers from those in the databases which may be of relevance and *not* to document the ones which were discarded on the basis of title alone. This is normal custom and professional practice in other work that we perform for regulatory clients. If this option was selected the time required to perform the screening exercise would be reduced and hence this phase would have a lower cost. This second option would require the following inputs of staff time:

- Gold: 25 hours (~3 staff days)
- PGMs: 426 hours (~ 11 staff weeks)
- Rhenium: 8 hours (~ 1 staff day)

A third option, specifically for the PGMs, would be to include use of authoritative published reviews, such as those by the WHO for platinum and palladium, as a baseline and to conduct additional searches only for the years subsequent to the search date in the published review. This is also normal custom and professional practice in other work that we perform for regulatory clients and it has the advantage of focusing the literature search where it is most needed. On this basis the following staff inputs would be required:

- Gold: 25 hours
- PGMs: 300 hours (~ 8 staff weeks)
- Rhenium: 8 hours (~ 1 staff day)

A fourth and final option is to combine option 1 for gold and rhenium and option 3 for PGMs.

A search of the Ecotox database shows that there are rather few data (gold = 8, PGMs = 11 and rhenium = 1) so all ecotoxicity data will be included for further analysis in Phase II. Collation of the physicochemical properties and the ecotoxicity data will require an additional 120 hours of staff input.

For substances falling into the 1 – 10 tonnes per year band data should normally be provided during Registration for the following environmental endpoints, as stipulated in REACH Annex VII:

- Physicochemical properties
    - State at 20^{o}C and 103.3 kPa
    - Melting/freezing point
    - Boiling point
    - Relative density
    - Vapour pressure
    - Surface tension
    - Water solubility
    - Partition coefficient
    - Flash point
    - Flammability
    - Explosive properties
    - Self-ignition temperature
    - Oxidising properties
    - Granulometry

Note that not all of the properties listed above are required for all substances. For example, the partition coefficient and flash point are not required for any inorganic substance:

- Toxicological properties
    - Skin irritation or corrosion (based on available data, acid/alkaline reserve or *in vitro* data)
    - Eye irritation (based on available data, acid/alkaline reserve or *in vitro* data)
    - Skin sensitisation (based on available or *in vivo* LLNA data)
    - *In vitro* gene mutation
    - Oral acute toxicity

- Ecotoxicological properties
    - Short-term toxicity to aquatic invertebrates (preferably *Daphnia*)
    - Growth inhibition of aquatic plants (preferable algae)

Note that ready biodegradability studies are not required for inorganic substances.

For substances in the tonnage band of 10-100 tonnes per year the following minimum information is required, in addition to the parameters listed above, as stipulated in REACH Annex VIII:

- Physicochemical properties
    - Hydrolysis as a function of pH
    - Adsorption/desorption screening

- Toxicological properties
    - *In vivo* skin irritation
    - *In vivo* eye irritation
    - *In vitro* cytogenicity
    - Acute inhalation toxicity
    - Acute dermal toxicity
    - Short-term repeated dose toxicity
    - Reproductive/developmental toxicity screen
    - Toxicokinetics (if data are available)

Note that there are many opportunities for presenting technical arguments for waiving many of these tests on the basis of likely exposure or toxicity.

- Ecotoxicological properties
    - Short-term toxicity to fish
    - Activated sludge respiration inhibition

Note that degradation studies are not required for inorganic substances.

For on-site isolated intermediates used under strictly controlled conditions, the information requirements on substance intrinsic properties (physicochemical, human health and environment properties) are reduced to readily available data held by the manufacturer, or "obtainable from other sources". wca currently interprets this within the context of a consortium such as the PMC as meaning that this rather vague requirement will be met sufficiently for the purposes of the ECHA if all members of the PMC agree to share their data on isolated intermediates. Therefore, the time required to search for these substances could be substantially reduced. However, if read-across is to be effective then it is important that all relevant data are used, so we do not recommend constraining the search for data for isolated intermediates in this Phase.

Once potentially useful data have been identified we will produce separate matrices for gold, each PGM (six in total) and rhenium. These matrices will identify the total number of potential studies available for each tonnage-relevant endpoint, although the quality of these studies and therefore their suitability for fulfilling REACH requirements will not be known until work is undertaken in the next phase. The matrices will clearly identify required IUCLID endpoints for which there are no data (and for which read across, exposure-based waiving, or testing may be required). The matrices will allow us to scope and price the next Phase of work more accurately because we will know the precise number of studies that need to be reviewed. The matrices would be accompanied by a succinct report describing the search strategy and findings, and spreadsheets detailing the decisions made about each of the study titles (option 1) or abstracts (options 2 and 3) reviewed in this Phase.

This Phase of the project would be performed exclusively by, and be the sole responsibility of, wca environment limited (Mark Crane, Graham Merrington, Adam Peters and Albania Grosso) and would be charged at a fixed price of £55000 (fifty-five thousand pounds sterling; excl. VAT) for option 1, £41000 (forty-one thousand pounds sterling; excl. VAT) for option 2, £30000 (thirty thousand pounds sterling; excl. VAT) for option 3, or £31800 (thirty-one thousand eight hundred pounds sterling; excl. VAT) for option 4. We are able to offer a fixed price for this Phase because unknown variables, such as the number of papers that would subsequently require detailed analysis, are considered only in later Phases. This task would be completed within four months of project inception.

PHASE II: TEST DEROGATION ASSESSMENT

The output of Phase II will be a set of fully quality assured data for each substance or category, final identification of data gaps, and carefully argued cases for any test waivers on the basis of their likely importance in either an environmental or human health risk assessment.

Potentially relevant data identified in Phase I will be scored for quality (Klimisch score of 1 – 4). Studies scored 1 or 2 will be carried forward in the assessment. Studies with a score of 3 (invalid) will not be used further, and the reasons for this will be documented. Studies receiving a score of 4 (non-assignable) will only be used to support the results from studies scored 1 or 2, if this is necessary. Ten per cent of the data, selected at random, will be reassessed by another member of staff as part of our Quality Assurance system. Both HERAG (Fact Sheet 6) and MERAG (Fact Sheet 3) will be considered during this phase of the project. When necessary we will at this stage also extend the search for relevant data beyond those substances that the PMC wishes to Register. For example, there may be substances (e.g., osmium) for which very little data is available for the substances that are to be registered and it may be useful to extend the search to other compounds with the same metal to read across and to use in a weight of evidence approach for the assessment.

Once the data gap analysis is complete, a detailed assessment of the potential for test derogation and read-across from one substance to another can be conducted. The main basis for test derogation will be the potential for scientifically-based grouping of substances in the gold, PGMs and rhenium categories. The European Commission's Joint Research Centre and OECD have provided guidance and examples of when this is likely to be defensible[1,2]. For metals, the general approach taken for cadmium, copper and nickel during risk assessments has been to consider the available data,

[1] Worth A Patlewicz G. 2007. A compendium of case studies that helped to shape the REACH guidance on chemical categories and read across. EC JRC EUR 22481, Ispra, Italy.
[2] OECD. Guidance on grouping of chemicals. 2007. Organisation for Economic Co-operation and Development Environment Health and Safety Publications. Series on Testing and Assessment No. 80, Paris, France.

including differences in the chemistry that are likely to lead to different physical or biological behaviour, particularly (bio)availability (cf. MERAG), and then to read across from a realistic worst-case value to ensure conservatism. When sufficiently reliable data are not available for read-across there is consideration of whether the absence of such data might be critical for risk characterisation, given likely exposure scenarios. If evidence suggests that exposure of particular receptors (e.g., aquatic environment, human occupational exposure) is unlikely to occur, a case can be made for test derogation.

This general approach has been accepted by the Commission during risk assessments of metals and is therefore the approach that we would use when considering whether testing is necessary to fill data gaps. We would follow these steps to achieve a defensible grouping:

1. Analyse available physicochemical data on each substance to determine whether there are any fundamental differences, particularly in metal ion oxidation state, water solubility, crystalline structure or particle size.

2. Compare differences in solubility and other physicochemical data with available data on toxicity to humans or the environment, and to any available toxicokinetic data.

3. Examine the possible influence of any counter ions.

If by following these steps there is still insufficient information to place a substance in a category, OECD[2] (with substantial input from EC JRC) recommends that *in vitro* approaches, such as examination of relative solubilities in physiological media, might be a way of avoiding the need for *in vivo* data.

This Phase of the project would be performed by staff at wca environment limited (Mark Crane, Graham Merrington, Adam Peters, Chris Watts and Albania Grosso) and bibra (where James Hopkins, Pete Watts, Philip Copestake and Tanya Diver will be responsible for the quality of the evaluations), with the former assessing physicochemical and ecotoxicological data, and the latter assessing mammalian toxicology data. It is not possible at this stage to identify the overall charge for this Phase because this depends on the number of studies that emerge from Phase I which need to be assessed. An indicative price is £10000 (ten thousand pounds sterling; excl. VAT) per substance/category, with the minimum possible number of categories equalling eight. This estimate is based on one study per tonnage-relevant endpoint per substance/group. However, substances are likely to need to be categorised on the basis of their oxidation states, as this can have a significant impact on their fate and behaviour in the environment and their effects on organisms. On this basis we would expect there to be in the region of 16 categories for platinum group metals, 3 categories for gold and 2 categories for rhenium. It may not be necessary to undertake environmental assessments for oxidation states which are unstable in environmental media, although the resulting oxidation state would need to be considered (this would apply for oxidation states with a reasonable worst case half-life in the environment of <12 hours). The possibility that further subgroups may be required cannot be discounted at this stage where there are marked differences in the behaviour or effects between compounds of the same oxidation state, for example if potentially toxic anions are present. A realistic estimate of the number of categories that might result from this phase of the project is therefore ~21, with an overall indicative price of ~£210000 (two hundred and ten thousand pounds sterling; excl. VAT).

We would aim to complete this task within 12 months of the end of Phase I (i.e., 16 months after project inception), but this would depend on the volume of studies that require detailed assessment, which is currently unknown.

PHASE III: TEST PROGRAMME DESIGN

At this stage, before collation of available data and examination of potential grouping, it is not possible to define exactly what empirical testing would be required. However, we are able to state some principles that we would follow when designing and monitoring a test programme.

1. The design of the test programme would be *de minimis* and would draw extensively on arguments for test derogations in Phase II (and could also be influenced by the outcome of the risk assessments undertaken in Phase IV). It is quite possible that, on the basis of read-across or negligible exposure, no *in vivo* testing will be required for one or more categories identified in Phase II.

2. When testing does appear to be unavoidable for an endpoint within a category we will identify the minimum number of tests required to establish a valid result for that endpoint. For example, if acute invertebrate data are missing for a group we would identify members of that category with the most different physical and chemical characteristics and design tests for them in order to maximise the potential for data read-across.

3. Wherever possible, we would recommend the use of more cost-effective *in vitro* or limit tests. For example, if an acute fish test is required, but there is evidence from invertebrate tests to suggest that members of a category display similar toxicity, we would design a programme in which limit tests with fish were used to examine whether toxicity to fish was similar for just two category members with the most different physical and chemical characteristics.

4. We would use our contacts with colleagues at the EC's Joint Research Centre to test our views on *de minimis* approaches to testing, and would not commission any toxicological tests until approval has been given by the ECHA, as required under REACH.

5. We would manage the commissioning of any required studies by drawing up a detailed test programme specification, agreeing it with the PMC, and sending it to at least three GLP-compliant contract research laboratories who express an interest in tendering for the studies(s) when initially contacted by telephone. Ideally, one laboratory would be used to perform all required tests so that volume discounts can be negotiated and study monitoring is easier and therefore less expensive.

6. During the tendering process we would visit each laboratory and assess its competence to perform the required tests, using the criteria identified under ISO 17025.

7. We would provide our recommendations to the PMC Project Leader on the best value location to perform each test on the basis of competence and cost.

8. When one or more contract laboratories have been selected to perform one or more tests we would make an unannounced visit to that laboratory during a test and would monitor competence once again according to ISO 17025 criteria.

9. Finally, we would complete the Phase II matrix using the results from the testing programme, revaluate categories and produce a report for the PMC on the outcomes of the programme and their implications for REACH registration.

The overall cost of empirical testing is unknown until substance categories and data gaps have been determined. However, we estimate that if an intelligent testing approach is commissioned for a category, based on a PGM category for which there are no hazard data, the overall cost of performing, monitoring and reporting test results for two substances within each category would be:

- Ecotoxicology:
  - 1-10 tonne pa requirements = ~£23000
  - 10-100 tonne pa requirements = ~£33000
- Toxicology
  - 1-10 tonne pa requirements = ~£50000
  - 10-100 tonne pa requirements = ~£150000

We would aim to complete an initial test programme design within two months of the end of Phase II. The duration of the test programme itself will depend on the volume of tests required and the capacity and turnaround time of the contract laboratories. However, none of the required tests are of particularly long duration so this part of the programme is unlikely to take more than six months to complete if there is sufficient laboratory capacity. In any case it might be advisable not to initiate any experimental studies until at least some preliminary output from Phase IV is available. Phase III of the project would be undertaken by staff at wca environment limited (Mark Crane, Graham Merrington, Adam Peters, Chris Watts and Albania Grosso) and bibra (James Hopkins, Pete Watts, Philip Copestake and Tanya Diver), with study monitoring performed by a team comprising Paul Brantom (mammalian toxicology), Mark Crane (ecotoxicology) and Chris Watts (analytical chemistry). Both the latter are UKAS trained laboratory assessors.

PHASE IV: PRODUCTION OF CHEMICAL SAFETY ASSESSMENTS AND REPORTS

Chemical safety reports (CSR) must be submitted to the ECHA for substances manufactured or imported above 10 tonnes per years. For on-site isolated intermediates, dossier and substance evaluation do not apply. However the Member State Competent Authority (MSCA) where the manufacturing site is located may request additional information.

Information sent to us by the PMC show that the number of substances which fall in the >10 tonnes per year tonnage bands and are not intermediates are as follows:

- Gold – one substance
- PGMs – 13 substances
- Rhenium – four substances

This is a total of 18 Chemical Safety Reports.

We would follow the guidance contained in MERAG (Fact Sheets 02, 05, 06) and HERAG (Fact Sheets 01, 02, 03) on exposure assessments for human health and the environment, in addition to relevant available regulatory guidance, when producing CSA/CSRs, particularly when considering exposure scenarios. Input would also be required from both producers and downstream users of the substances in order to develop sufficiently robust exposure scenarios.

The CSA/CSR will comply with the format and content detailed in Annex I of the REACH regulations. These require that the CSR contains the following 10 sections:

- Substance identity and physical and chemical properties
- Manufacture and uses

- Classification and labelling
- Environmental fate properties
- Human health hazard assessment
- Human health hazard assessment of physicochemical properties
- Environmental hazard assessment
- PBT and vPvB assessment
- Exposure assessment
- Risk characterisation

Derivation of DNELs and PNECs is carried out during human health and environmental hazard assessment. Exposure scenario development is the core process to carry out a Chemical Safety Assessment. The first assessment is based on the required minimum data plus all available hazard information, and on exposure estimates that correspond to initial assumptions about operating conditions and risk management measures (an initial exposure scenario). If the initial assumptions lead to a risk characterisation indicating that risks to human health and the environment are not adequately controlled then it is necessary to carry out an iterative process with amendment of one or more factors in the hazard or exposure assessment, with the aim of demonstrating adequate control. The refinement of hazard assessment may require generation of additional hazard information. The refinement of exposure assessment may involve appropriate alteration of the operational conditions or risk management measures in the exposure scenario or more precise exposure estimation. The exposure scenario, resulting from the final iteration (a final exposure scenario), is included in the Chemical Safety Report and attached to the Safety Data Sheet.

Exposure scenarios will cover any manufacture and all identified uses. In particular, an exposure scenario will include, where relevant, a description of:

- Operational conditions
  - processes involved, including the physical form in which the substance is manufactured, processed and/or used,
  - activities of workers related to the processes and the duration and frequency of their exposure to the substance,
  - activities of consumers and the duration and frequency of their exposure to the substance,
  - duration and frequency of emissions of the substance to the different environmental compartments and sewage treatment systems and dilution in the receiving environmental compartment.
- Risk management measures
  - risk management measures to reduce or avoid direct and indirect exposure of humans (including workers and consumers) and the different environmental compartments to the substance,
  - waste management measures to reduce or avoid exposure of humans and the environment to the substance during waste disposal and/or recycling.

Exposure levels will need to be estimated for each exposure scenario and for all relevant exposure routes (e.g., oral, inhalation, dermal). The exposure estimation will then be carried forward to the risk characterisation in the Chemical Safety Report and compared with the appropriate DNELs and PNECs to determine if risks to humans and the environment are adequately controlled. The CSR format will comply with that detailed in Section 7 of REACH Annex I.

The PMC has stated that compilation of IUCLID 5 files and Registration dossiers will take place in Phase V of the project, but in reality CSAs, CSRs and preparation of IUCLID 5 files will take place in parallel because they are interlinked activities. For this reason, and because we do not yet know the

number of uses that would need to be included in a CSR, we cannot provide accurate prices at this stage for all possible CSAs/CSRs in this project. However, an indicative cost per CSA/CSR is in the region of £3500 to £10000 (three thousand five hundred to ten thousand pounds sterling; excl. VAT) assuming that data collation and reviewing, robust summary preparation and IUCLID 5 entry are undertaken in other phases, and that there are a limited number of straightforward exposure scenarios.

This Phase of the project would be undertaken by staff at wca environment limited (Mark Crane, Graham Merrington, Adam Peters, Chris Watts and Albania Grosso) and bibra (where James Hopkins, Pete Watts, Philip Copestake and Tanya Diver will be responsible for supervision and quality of the mammalian toxicology contribution). We would aim to complete this task within four months of the end of Phase III.

PHASE V: COMPILATION OF IUCLID 5 FILES AND REGISTRATION DOSSIERS

Submission must be electronically via IUCLID 5 software and must contain the following information:

- Manufacturer/importer identity
- Substance identity, manufacture and use
- Tonnage band
- Substance classification and labelling
- Safe use guidance and uses advised against
- Substance intrinsic properties in the form of robust summaries
- Whether the above information has been reviewed by an assessor
- Proposals for further testing, if relevant
- Main use categories, type of uses and significant routes of exposure (for substances registered in quantities of 1 to 10 tonnes per year)

Table 1 contains the endpoints for which data are required to input into IUCLID 5 for substances which fall within the 1-10 and 10-100 tonnage bands. IUCLID 5 input will be conducted by staff with full training in use of IUCLID 5.

As before, we cannot provide accurate price estimates for this Phase until completion of Phase I. However, an indicative cost for compilation of IUCLID 5 files and Registration dossiers for each substance/category is in the region of £5000 to £10000 (five to ten thousand pounds sterling; excl. VAT) assuming that data selection is performed in other Phases and that there are not very large numbers of studies for individual IUCLID 5 entries. On average it seems likely that compiling IUCLID 5 files for substances falling into the 1-10 tpa band is likely to cost less than for substances falling into the 10-100 tpa band, because of the different data requirements. However, this depends entirely on the number of individual studies available per substance. It is quite possible that there will be large numbers of studies available for a lower tonnage band substance and very few available for a higher tonnage band substance, which would lead to a lower charge for the latter compared to the former. Costs might also be reduced if a category template is produced in IUCLID to allow a particular endpoint to be linked to dossiers for several substances within a category. A more accurate price estimate for Phase V can only reasonably be attempted after completion of Phases I and II. However, estimates for work performed in Phase V would be provided for each task and transparent records of time spent on each task would be maintained.

This Phase of the project would be undertaken by staff at wca environment limited (Mark Crane, Graham Merrington, Adam Peters, Chris Watts and Albania Grosso) and bibra (where James Hopkins, Pete Watts, Philip Copestake and Tanya Diver would be responsible for supervision and quality of data

entry on mammalian toxicity aspects). We would aim to complete this task within four months of the end of Phase III, in parallel with Phase IV. If the estimated timescales in earlier Phases are not exceeded and the project begins in July 2008, the Registration dossiers for all substances would be submitted to the PMC by November 2010. However, note that there are considerable uncertainties about test laboratory capacity, which means that testing in Phase III may not be achievable within six months. If this is the case, the project phases will need to be discussed further with the PMC to ensure that Registration takes place at a time that balances the commercial desire to Register early with the technical and regulatory requirements of REACH.

Table 1. IUCLID endpoints required for substances in 1-10 and 10-100 tonnage bands (endpoints in light red are applicable only to tonnage band 10-100 and those in dark red are for tonnage of greater than or equal to 100.

7.0.0.0	PHYS-CHEM	8.0.0.0	TOXICITY	9.0.0.0	ECOTOXICITY
7.1.0.0	Physical state	8.1.0.0	SKIN IRRITATION OR SKIN EROSION	9.1.0.0	AQUATIC TOXICITY
7.2.0.0	Melting point	8.1.0.0 (1)	Assessment of available human & animal data	9.1.1.0	Short-term Daphnia
7.3.0.0	Boiling point	8.1.0.0 (2)	Assessment of the acid or alkaline reserve	9.1.2.0	Algae
7.4.0.0	Relative density	8.1.0.0 (3)	In vitro study for skin corrosion	9.1.3.0	Short-term fish
7.5.0.0	Vapour pressure	8.1.0.0 (4)	In vitro study for skin irritation	9.1.4.0	Sludge respiration inhibition
7.6.0.0	Surface tension	8.1.1.0	In vivo skin irritation		
7.7.0.0	Water solubility	8.2.0.0	EYE IRRITATION	9.1.5.0	Long-term Daphnia
7.8.0.0	Partitioning octanol-water	8.2.0.0 (1)	Assessment of available human & animal data	9.1.6.1	FELS Fish ELS
7.9.0.0	Flash point	8.2.0.0 (2)	Assessment of the acid or alkaline reserve	9.1.6.2	Fish Embryo
7.10.0.0	Flammability	8.2.0.0 (3)	In vitro study for eye irritation	9.1.6.3	Fish Juvenile Growth
7.11.0.0	Explosive properties	8.2.1.0	In vivo eye irritation	9.2.0.0	DEGRADATION
7.12.0.0	Self ignition temperature	8.3.0.0	SKIN SENSITISATION	9.2.1.1	Ready biodegradation
7.13.0.0	Oxidizing properties	8.3.0.0 (1)	Assessment of the available human, animal & alternative data	9.2.1.2	Simulation test water
7.14.0.0	Granulometry	8.3.0.0 (2)	In vivo testing	9.2.1.3	Simulation test soil
7.15.0.0	Stability of substance	8.4.0.0	MUTAGENICITY	9.2.1.4	Simulation test sediment
7.16.0.0	pKa	8.4.1.0	In vitro gene mutation study in bacteria		
7.17.0.0	Viscosity	8.4.2.0	In vitro cytogenicity study in mammalian cells or in vitro micronucleus test	9.2.2.1	Hydrolysis
				9.2.3.0	Identif. Deg. Products
		8.4.3.0	In vitro gene mutation study in mammalian cells	9.3.0.0	FATE & BEHAVIOUR
		8.5.0.0	ACUTE TOXICITY	9.3.1.0	Ads/Des Screening
		8.5.1.0	By oral route	9.3.2.0	Bioaccumulation in fish
		8.5.2.0	By inhalation route		
		8.5.3.0	By dermal route	9.3.3.0	Further info on adsorp/desorp
		8.6.0.0	REPEATED DOSE TOXICITY		
		8.6.1.0	Short-term repeated dose toxicity study (28 days)		
		8.6.2.0	Subchronic toxicity study (90 days)		
		8.7.0.0	REPRODUCTIVE TOXICITY		
		8.7.1.0	Screening for reproductive/developmental toxicity (OECD 421 or 422)		
		8.8.0.0	TOXICOKINETICS		
		8.8.1.0	Assessment of toxicokinetic behaviour from available information		
		8.7.2.0	Pre-natal developmental toxicity study (e.g. OECD 414)		
		8.7.3.0	Two-generation reproductive toxicity study		

Expertise

We have assembled a project team comprising Dr Mark Crane (Project Manager and Key Account Manager), Albania Grosso, Dr Graham Merrington, Dr Adam Peters, and Dr Chris Watts (all wca), James Hopkins, Pete Watts, Philip Copestake and Tanya Diver (all bibra), and Dr Paul Brantom (Brantom Risk Assessment - who would organise, monitor and assess any required Phase III mammalian toxicity studies). Pen portraits for these staff are provided below and full curricula vitae for all of them are in Appendix 1. This team provides high level expertise in the fate, behaviour, environmental toxicology, mammalian toxicology and risk assessment of metals.

Mark Crane, PhD, is a Director at wca environment and an environmental toxicologist with over 20 years of experience in environmental consultancy and academia. Mark will lead and manage the project and has extensive experience in assessing ecotoxicology data for government and commercial clients for the OECD HPV programme and under the Existing Substances Regulations. He is currently project manager for a UK Defra contract to review the environmental parts of all SIARs passing through the SIAM process.

Albania Grosso, MSc, is a Principal Scientist at wca environment and an environmental scientist with over 14 years experience in environmental consultancy and environmental regulation. Albania has extensive expertise in chemical exposure assessment and has provided advice to UK regulators and EU committees. She has expertise in assessing the fate and behaviour of substances in the environment for both human and ecological receptors.

Graham Merrington, PhD is a Director at wca environment and an environmental scientist with over 14 years of experience in environmental consultancy, environmental regulation and academia. He represented the UK at Expert Groups for the Water Framework Directive, and was a regular attendee as an expert for metals-related issues at European Commission TCNES. He has considerable experience in the environmental risk assessment of trace metals and has been closely involved in the Existing Substances Regulations metals risk assessments, in the development of Environmental Quality Standards for metals and the preparation of the Metals Environmental Risk Assessment Guidance (MERAG). Graham has recently worked with regulatory colleagues on REACH Implementation Project Expert Working Groups to define appropriate ecotoxicity testing approaches under the REACH regulations. His main areas of expertise are in the assessment of environmental fate and behaviour of chemicals; soil chemistry and chemical bioavailability; bioaccumulation and biomagnification through food chains; environmental management frameworks; and project management.

Adam Peters, PhD is a Principal Scientist at wca environment and an environmental chemist with over 9 years of experience in environmental consultancy, environmental regulation and academia. He has been responsible for management of environmental aspects of the Notification of New Substances scheme and the Existing Substances Regulations in the UK, and has recently been a regular attendee as an expert for metals-related issues at European Commission TCNES. He has been closely involved with the development of Environmental Quality Standards for metals and the preparation of the Metals Environmental Risk Assessment Guidance (MERAG). Adam's main areas of expertise are in the assessment of environmental fate, behaviour, bioavailability and effects of trace metals; environmental risk assessment of industrial chemicals; assessment of persistent, bioaccumulative and toxic (PBT) substances; Hazard assessment of waste materials and their recovery; and development and validation of environmental quality standards.

Chris Watts, PhD is a Director at wca environment and an environmental chemist with over 30 years of experience in environmental research and consultancy. He is a member of the Royal Society of Chemistry and is currently chairman of the RSC's Water Science Forum Committee. He is also a member of the RSC's Energy, Sustainability and Environment Forum and has served on BSi and ISO environmental standards committees and on Defra's Shadow Health Advisory Group for Chemical Contamination Incidents. Chris also has extensive expertise in applying existing approaches and models for environmental risk assessment (ERA) of chemicals, assessment of the environmental behaviour, fate and effects of chemicals and designing implementing environmental monitoring programmes.

Staff at wca environment are well placed to provide advice and services to the precious metals industry because of our familiarity with the European chemicals management regulations and specific knowledge of the difficulties in assessing metals and metal compounds.

James Hopkins is a toxicologist at bibra with 32 years of experience in the field of chemical toxicology. He managed a sizeable group of desk-based toxicologists in a research organisation for many years and, since 2003, has been Managing Director of a company providing high-quality consultancy and advice to industrial organisations and government departments on all aspects of chemical toxicology. He has extensive experience in reviewing and critically evaluating toxicological data for a wide range of chemicals and a cross-section of industrial sectors. James has also been involved in compiling a large number of critical reviews of chemicals and several strategy documents for national governments on both sides of the Atlantic. James is on the Register of Toxicologists of EUROTOX and of the Institute of Biology/British Toxicology Society.

Peter Watts has specialized in chemical toxicology at bibra since 1981. Peter has been involved in a number of different European projects including EU-funded Concerted Action Projects instigated to construct EUROPOEM, a generic databases of operator, bystander and re-entry worker exposures to plant protection products and to develop predictive models, and RIP3.3-1, a scoping project aimed at producing guidance for data requirements under REACH, including consideration of data sources, data quality, alternatives to study data and study waivers. He has also authored or co-authored a number of WHO-IPCS CICADs and has acted as a temporary adviser to the WHO at FRB meetings where the CICADs have been finalized. Peter has many years experience of reviewing and critically evaluating toxicological data on a wide range of chemicals for government departments and industrial organisations. Peter is on the Register of Toxicologists of EUROTOX and of the Institute of Biology/British Toxicology Society.

Philip Copestake is a toxicologist at bibra with over 20 years experience. He has authored or co-authored a number of WHO-IPCS CICADs and has acted as a temporary adviser to the WHO at FRB meetings where the CICADs have been finalized. He was involved, from 1991-2000, in the production of the International Chemical Safety Cards (ICSCs), a project co-ordinated by the International Programme on Chemical Safety of the WHO, and served as a member of the Peer-Review Committee for this project. Philip's background in Information Sciences has led to him giving a number of external presentations and lectures on the use of information resources in toxicology, at the University of Surrey. He is experienced in reviewing and critically evaluating toxicological data on a wide range of chemicals and has considerable knowledge of the preparation of dossiers for submission to regulatory authorities. Philip is on the Register of Toxicologists of EUROTOX and of the Institute of Biology/British Toxicology Society.

Tanya Diver is a toxicologist at bibra with over 22 years of experience in reviewing and critically evaluating toxicological data on a wide range of chemicals. She is an experienced writer and peer-reviewer of literature reviews, and has prepared numerous independent hazard and risk assessments

of chemicals for both industry and government departments around the world. She is the author of over fifty bibra Toxicity Profiles, and contributes regularly to the bibra monthly current-awareness journal, *Toxicology and Regulatory News*. Tanya is on the Register of Toxicologists of EUROTOX and of the Institute of Biology/British Toxicology Society.

Bibra – toxicology advice & consulting staff are well suited to provide advice and services to the precious metals industry because of their expertise in chemical toxicology and the unique toxicology database and databank which allows them instant access to critical toxicity data.

Paul Brantom, PhD is the principal of Brantom Risk Assessment Ltd. Paul has worked in the field of toxicology for more than 34 years, combining experience of supervising the conduct of all varieties of experimental regulatory toxicology studies to GLP and consultancy support to a variety of organisations and companies. Particular interests are the use of in vitro models in risk assessment as well as quantitative toxicological risk assessment. He joined BIBRA in 1969 and until March 2004 was Head of Toxicology and Information Services at BIBRA International. Paul managed the Centre for Toxicology at the University of Surrey, Guildford, for more than 3 years and has retained links with the Centre. The Centre is conceived to bring focus to the toxicological activities of the School of Biomedical and Life sciences and runs a very popular course for managers in the fundamentals of toxicology. As a registered European Toxicologist Paul has worked for numerous companies and organisations in various capacities relating to toxicological evaluation and registration of products. He is currently a member of the UK Veterinary Products Committee(VPC), Veterinary Residues Committee (VRC), Advisory Committee on Animal Feedingstuffs (ACAF), Advisory Committee on Novel Foods and Processes (ACNFP) and the European Food Safety Authority (EFSA) Panel on Additives to Animal Feed (FEEDAP).

Project management and Quality Assurance

Mark Crane will be overall Project Manager with responsibility for ensuring project delivery to time, quality and budget. He will proactively liaise with all project staff at wca and bibra and will organise and minute monthly teleconferences between PMC representatives and relevant project staff.

wca environment is accredited to ISO 9001 and will manage the project within that quality system. All outputs will be peer reviewed by at least one other member of the project team before being submitted to the PMC. wca environment also operates an Environmental Management System accredited to ISO 14001.

Financial offer

The prices quoted below are firm for Phase I and indicative for subsequent phases. All prices are quoted in pounds sterling, excluding any applicable VAT, and are valid until 30 June 2008.

Phase	Cost
Phase 1: Literature Search and Data gap analysis	
Gold (option 1)	3550
Gold (option 2/3)	2200
PGMs (option 1)	49900
PGMs (option 2)	37730
PGMs (option 3)	26700
Rhenium (option 1)	1550
Rhenium (option 2/3)	1100
Phase II: Test Derogation Assessment	
Gold (likely to be up to 3 categories)	£10000 per substance/category
PGMs (likely to be up to 16 categories)	£10000 per substance/category
Rhenium (likely to be up to 2 categories)	£10000 per substance/category
Phase III: Test Programme Design (estimated prices for testing two substances per category	
Gold	
Ecotox (1-10 tonnes)	£23000
Ecotox (10-100 tonnes)	£33000
Mammalian Toxicology (1-10 tonnes)	£50000
Mammalian Toxicology (10-100 tonnes)	£150000
PGMs	
Ecotox (1-10 tonnes)	£23000
Ecotox (10-100 tonnes)	£33000
Mammalian Toxicology (1-10 tonnes)	£50000
Mammalian Toxicology (10-100 tonnes)	£150000
Rhenium	
Ecotox (1-10 tonnes)	£23000
Ecotox (10-100 tonnes)	£33000
Mammalian Toxicology (1-10 tonnes)	£50000
Mammalian Toxicology (10-100 tonnes)	£150000
Phase IV: Production of CSA/CSR	
Gold	£3500-£10000 per substance
PGMs	£3500-£10000 per substance

Phase	Cost
Rhenium	£3500-£10000 per substance
Phase V: IUCLID 5 Files and Registration Dossiers	
Gold	£5000-£10000 per substance
PGMs	£5000-£10000 per substance
Rhenium	£5000-£10000 per substance

APPENDIX 1 STAFF CURRICULA VITAE

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Mark CRANE**
Address(es)	wca environment limited, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Telephone(s)	(+44 01367) 244311 Mobile: 07845 929978
Fax(es)	(+44 01367) 244311
E-mail	mark.crane@wca-environment.com
Nationality	British
Date of birth	12.04.1962
Gender	Male

Desired employment / Occupational field

ENVIRONMENTAL CONSULTANT (ENVIRONMENTAL TOXICOLOGY)

Work experience

Dates	May 2005 - Present
Occupation or position held	Director
Main activities and responsibilities	Technical responsibilities include direct work on, and supervision of, ecotoxicity and environmental consultancy projects. Managerial responsibilities include staff and project management on technical projects.
Name and address of employer	wca environment limited, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Type of business or sector	Environmental consultancy
Dates	January 1998 – April 2005
Occupation or position held	Managing Partner
Main activities and responsibilities	Technical work on environmental toxicology and chemistry; project management; training and workshop facilitation.
Name and address of employer	Crane Consultants, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Type of business or sector	Environmental consultancy
Dates	April 1994 – December 2001

Occupation or position held	Senior Lecturer in Biological Sciences
Main activities and responsibilities	Teaching and research in environmental toxicology and chemistry, and limnology.
Name and address of employer	School of Biological Sciences, Royal Holloway, University of London, Egham, Surrey, TW20 0EX, UK
Type of business or sector	Higher Education
Dates	December 1988 – March 1994
Occupation or position held	Research Scientist
Main activities and responsibilities	Research into the effects of contaminants on fish, aquatic invertebrates and plants using laboratory tests, mesocosms and field survey techniques; desk-based consultancy on environmental toxicology and chemistry for government and commercial clients.
Name and address of employer	WRc plc, Henley Road, Medmenham, Buckinghamshire, SL7 2HD, UK
Type of business or sector	Environmental research and consultancy

Education and training

Dates	2000-2001
Title of qualification awarded	Diploma in Management
Principal subjects/occupational skills covered	Management of staff, projects and budgets
Name and type of organisation providing education and training	Institute of Leadership and Management
Level in national or international classification	ISCED 5
Dates	1990 - 1993
Title of qualification awarded	PhD
Principal subjects/occupational skills covered	Thesis title: Effects of Pollution on the Freshwater Shrimp *Gammarus pulex* L.
Name and type of organisation providing education and training	University of Reading, UK
Level in national or international classification	ISCED 6
Dates	1986 – 1987
Title of qualification awarded	Postgraduate Certificate in Education (Pass with Credit)
Principal subjects/occupational skills covered	Secondary school teaching theory and practice; specialist subjects: biology and chemistry
Name and type of organisation providing education and training	University of East Anglia, Norwich, UK
Level in national or international classification	ISCED 5
Dates	1981 – 1985
Title of qualification awarded	BSc (1st Class Hons.) Ecology
Principal subjects/occupational skills covered	Plant and animal biology and ecology; statistics, behavioural ecology, limnology.

Name and type of organisation providing education and training	University of East Anglia
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s)	**English**

Other language(s)

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
French	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user
Spanish	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user

(*) Common European Framework of Reference for Languages

Social skills and competences	Teamwork: I have managed or worked in teams for most of my professional life; I have contributed to committee work for government and professional societies (e.g., Veterinary Products Committee, Environmental Panel of the Advisory Committee on Pesticides, SETAC Europe Council). I have also undertaken voluntary work in teams in a hostel for homeless men and in youth clubs. Presentation skills: I have made many oral presentations at national and international conferences and workshops to both technical and lay audiences. Chairing & negotiating skills: I have chaired seminars for government and commercial clients; I taught negotiation skills to MSc students at the University of London.
Organisational skills and competences	I am currently Managing Director of wca environment limited, responsible for organising budgets, staff and workloads. I managed a team of 16 postgraduate and postdoctoral staff when I was a Senior Lecturer at the University of London. I have set up and run several technical consortia to meet client needs.
Technical skills and competences	Environmental toxicology and chemistry: expertise gained from formal PhD training, and research and consultancy experience over a 20 year period. Environmental risk assessment: expertise gained from consultancy experience over a 20 year period.
Computer skills and competences	MS Word, Excel, Access; Probabilistic modelling with Crystal Ball.
Driving licence	Full driving licence for cars and motorbikes.

Additional information

PUBLICATIONS

Co-editor of 5 books on environmental toxicology and chemistry, >50 reports for clients, and >120 peer-reviewed papers on environmental toxicology and chemistry. The most recent papers and reports are listed here:

- Grist EPM, O'Hagan A, **Crane M**, Sorokin N, Sims I, Whitehouse P. 2006. Bayesian and time-independent species sensitivity distributions for risk assessment of chemicals. *Environmental Science and Technology* 40:395-401.
- **Crane M**, Norton A, Leaman J, Chalak A, Bailey A, Yoxon M, Smith J, Fenlon. 2006. Acceptability of pesticide impacts on the environment: what do United Kingdom stakeholders and the public value? *Pest Management Science* 62:5-19.
- **Crane M**, Watts CW, Boucard T. 2006. Chronic aquatic environmental risks from exposure to human pharmaceuticals. *Science of the Total Environment* 367:23-41.
- Prenner MM, Ibrahim H, Lewis JW, **Crane M**. 2006. Toxicity and trace metal concentrations of sediments from Lake Maryut, Alexandria, Egypt. *Bulletin of Environmental Contamination and Toxicology* 77:616-623.
- Kwok KWH, Leung KMY, Lui GSG, Chu VKH, Lam PKS, Morritt D, Maltby L, Brock TCM, Van den Brink PJ**,** Warne M St J, **Crane M.** 2007. Comparison of tropical and temperate freshwater animal species acute sensitivities to chemicals: implications for deriving safe extrapolation factor. *Integrated Environmental Assessment and Management* 3:49-67.
- Leung KMY, Grist EPM, Morley NJ, Morritt D, **Crane M**. 2006. Chronic toxicity of tributyltin to development and reproduction of the European freshwater snail *Lymnaea stagnalis* (L.). *Chemosphere* 66:1358-1366.
- **Crane M,** Burton GA, Culp JM, Greenberg MS, Munkittrick KR, Ribeiro R, Salazar MH, St-Jean SD. 2007. Review of aquatic in situ approaches for stressor and effect diagnosis. *Integrated Environmental Assessment and Management* 3:234-245.
- **Crane M**, Babut M. 2007. Environmental Quality Standards for Water Framework Directive Priority Substances: Challenges and Opportunities. *Integrated Environmental Assessment and Management* 3:290-296.
- **Crane M,** Kwok KWH, Wells C, Whitehouse P, Lui GCS. 2007. Use of field data to support European Water Framework Directive quality standards for dissolved metals. *Environmental Science & Technology* 41:5014-5021.
- **Crane M**, Handy R. 2007. An Assessment of Regulatory Testing Strategies and Methods for Characterizing the Ecotoxicological Hazards of Nanomaterials. Report to Defra, London. UK.

KEY RECENT PROFESSIONAL EXPERIENCE

- Assessment of REACH strategic issues for Water UK.
- Use of QSAR and read across for developing Environmental Quality Standards for the European Commission.
- Support of a tiered approach to evaluate endocrine effects in aquatic organisms for CEFIC.
- Statistical analysis of fish lifecycle studies for OECD.
- Development of an alternative sample analysis for FEPA licensing for Defra.
- Assessment of water quality components of Environmental Statements for various clients
- Assessment of regulatory testing strategies and methods for characterizing the ecotoxicological hazards of nanomaterials for Defra.
- Assessment of environmental toxicology laboratory compliance with ISO 17025 for the United Kingdom Accreditation Service.
- Development of alternatives to animal testing for risk assessment to meet the requirements of new chemicals legislation for Defra.
- Desk based review of current knowledge on pharmaceuticals in drinking water and estimation of potential levels for Defra.
- Case study to develop tools and methodologies to deliver an ecosystem-based approach for Defra.
- Review of SIDS and SIARS for Defra.

Full cv available at www.wca-environment.com

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Albania GROSSO**
Address(es)	wca environment limited, Brunel House, Volunteer Way, Faringdon, Oxfordshire, SN7 7YR, UK
Telephone(s)	(+44 01367) 246022
Fax(es)	(+44 01367) 246041
E-mail	albania.grosso@wca-environment.com
Nationality	USA and UK (dual)
Date of birth	08.08.1969
Gender	Female

Desired employment / Occupational field

CHEMICAL EXPOSURE AND RISK ASSESSMENT

Work experience

Dates	January 2008 - Present
Occupation or position held	Principal Consultant
Main activities and responsibilities	Technical responsibilities include chemical exposure assessments and environmental consultancy projects.
Name and address of employer	wca environment limited, Brunel House, Volunteer Way, Faringdon, Oxfordshire, SN7 7YR, UK
Type of business or sector	Environmental consultancy
Dates	August 2006 – December 2007
Occupation or position held	Science Manager
Main activities and responsibilities	Leadership of research area and technical projects on environmental toxicology and chemistry, and project management. Managerial responsibilities included 8- 14 staff and project management on technical projects.
Name and address of employer	Environment Agency, Science Department, Evenlode House, Howbery Park, Wallingford, Oxfordshire OX10 8BD, UK
Type of business or sector	Government

Dates	October 2003 – July 2006
Occupation or position held	Principal Scientist – Human Health
Main activities and responsibilities	Project executive for numerous projects related to human exposure to soil contaminants. Liaison with other government bodies on research initiatives.
Name and address of employer	Environment Agency, Science Department, Evenlode House, Howbery Park, Wallingford, Oxfordshire OX10 8BD, UK
Type of business or sector	Government
Dates	July 2001 – September 2003
Occupation or position held	Senior Scientist
Main activities and responsibilities	Management of research projects into the effects of contaminants on people. Provided advice to other government offices on exposure assessment. Development of training on the technical implementation of new contaminated land legislation.
Name and address of employer	Environment Agency, Science Department, Evenlode House, Howbery Park, Wallingford, Oxfordshire OX10 8BD, UK
Type of business or sector	Government
Dates	April 2000- June 2001
Occupation or position held	Risk Assessment Specialist
Main activities and responsibilities	Leading risk assessment work, staff training, setting up quality management system for risk assessment projects.
Name and address of employer	Environmental Resources Management (ERM), Eaton House, Wallbrook Court, North Hinksey Lane, Oxford OX2 0QS, UK
Type of business or sector	Environmental consultancy
Dates	January 1997- March 2000
Occupation or position held	Risk Assessor
Main activities and responsibilities	Responsible for conducting and supervising human health and ecological risk assessments, site investigations and design, desk studies and statistical analysis.
Name and address of employer	WS Atkins Ltd, Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW
Type of business or sector	Environmental consultancy
Dates	May 1995- August 1996
Occupation or position held	Risk Assessor
Main activities and responsibilities	Conducting human health and ecological risk assessments; advice on statistical analysis of site investigation data. Site investigation design and implementation.
Name and address of employer	Burns & McDonnell Waste Consultants (USA), 9400 Ward Parkway, Kansas City Missouri 64114, USA
Type of business or sector	Environmental consultancy

Education and training

Dates	1992-1994
Title of qualification awarded	MSc
Principal subjects/occupational skills covered	Environmental Engineering – Non-point source pollution effects

Name and type of organisation providing education and training	University of Illinois – Champaign Urbana - USA
Level in national or international classification	ISCED 5
Dates	1990 – 1992
Title of qualification awarded	MSc
Principal subjects/occupational skills covered	Thesis title: Effects of Selected Heavy Metals on *Chlorella vulgaris*
Name and type of organisation providing education and training	Lehman College, City University of NY - USA
Level in national or international classification	ISCED 5
Dates	1985 – 1990
Title of qualification awarded	BSc
Principal subjects/occupational skills covered	Biological Sciences
Name and type of organisation providing education and training	Lehman College, City University of NY - USA
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s) **Spanish**

Other language(s) **English**

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
Italian	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user
Portuguese	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user

(*) Common European Framework of Reference for Languages

Social skills and competences	Coaching and mentoring of teams to ensure good teamwork is achieved and that outputs are delivered. Presentation skills: Strategic presentation for senior management and external stakeholders; technical presentations on risk various assessment issues.
Organisational skills and competences	Management of teams of scientists and research portfolio.
Technical skills and competences	Environmental toxicology and chemistry: expertise gained from formal education and research and consultancy experience over a 14 year period. Human health & environmental risk assessment: expertise gained from consultancy experience over a 14 year period.

Computer skills and competences	MS Word, Excel, Access; Probabilistic modelling with Crystal Ball.
Driving licence	Full driving licence for cars.
Additional information	PUBLICATIONS • Collins C, Fryer M, **Grosso A**. 2006. Plant Uptake of Non-Ionic Organic Chemicals. Environ. Sci. Tech. 40: 45-52. • Soldner M, Stephen I, Ramos L, Angus R, Wells NC, **Grosso A**, Crane M. 2004. Relationship between macroinvertebrate fauna and environmental variables in small streams of the Dominican Republic. Water Research, 38:863-874.. • Crane M, **Grosso A**, Whitehouse P, Forrow D. 2004 Risk characterisation in Direct Toxicity Assessment of the River Esk and the Tees Estuary. Ecotoxicology, 13:463-474. • Crane M, **Grosso A**. 2002. Time to event analysis of standard ecotoxicity data. In, Risk Assessment with Time to Event Models, edited by Crane M, Chapman P, Fenlon J, Newman M. CRC/Lewis Press, Boca Raton, FL., pp. 7-22. • Callaghan A, Fisher TC, **Grosso A**, Holloway GJ, Crane M. 2002. Effect of temperature and pirimiphos methyl on biochemical biomarkers in Chironomus riparius Meigen. Ecotoxicology and Environmental Safety 52:128-133. • Crane M, Sorokin N, Wheeler J, **Grosso A**, Whitehouse P, Morritt D. 2002. European approaches to coastal and estuarine risk assessment. In, Newman, M. (ed.) Coastal and Estuarine Risk Assessment, Lewis Publishers, Boca Raton, FL. pp. 15-39. • Crane M, **Grosso A**, Janssen C. 1999. Statistical techniques for the ecological risk assessment of chemicals in freshwaters. In, Statistics in Ecotoxicology, edited by T. Sparks, John Wiley & Sons, Chichester, pp. 247-278. • Postle, M., Fenn, T., **Grosso, A**. Steeds, J. 1999. Cost-Benefit Analysis for Remediation of Land Contamination. Environment Agency R&D Technical Report P316. • Crane M, **Grosso A**. 1999. Limits to forecasts of population dynamics in ecotoxicology. Aspects of Applied Biology 53:149-155. • Rachlin JW and **Grosso A.** 1993 - The growth response of the green alga *Chlorella vulgaris* to combined divalent cation exposure. *Archives of Environmental Contamination and Toxicology* **24**, 16-20. • Rachlin JW and **Grosso A.** 1991 - The effects of pH on the growth of *Chlorella vulgaris* and its interaction with cadmium toxicity. *Archives of Environmental Contamination and Toxicology* **20**, 505-508. KEY RECENT PROFESSIONAL EXPERIENCE • Assessment of risk assessment methodologies used across Europe – JRC Working Group. • Development of a risk screening framework for soil contaminants – ~Environment Agency R&D Report • Provision of advice on the implementation of contaminated land legislation for ecological receptors. • Technical input into the UK human health risk assessment methodology for land contamination. Full cv available at www.wca-environment.com

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Graham MERRINGTON**
Address(es)	wca environment limited, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Telephone(s)	00441285712712 Mobile: 07923415113
E-mail	Graham.merrington@wca-environment.co.uk
Nationality	British
Date of birth	21.10.68
Gender	Male

Desired employment / Occupational field

ENVIRONMENTAL CONSULTANT (ENVIRONMENTAL CHEMISTRY)

Work experience

Dates	April 2007 - Present
Occupation or position held	Principal Consultant
Main activities and responsibilities	Technical responsibilities include direct work on, and supervision of, environmental consultancy projects on soils, sediments and waters. Managerial responsibilities include project management on technical projects.
Name and address of employer	wca environment limited, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Type of business or sector	Environmental consultancy
Dates	September 2002 – March 2007
Occupation or position held	Principle Scientist
Main activities and responsibilities	Technical responsibilities included direct work on risk assessment and quality standard derivation and use. Managerial responsibilities include staff and project management on technical projects.
Name and address of employer	Environment Agency, Almonsbury West, Bristol, UK

Type of business or sector	Environmental Regulation
Dates	August 1998 – June 2002
Occupation or position held	Lecturer in Soil Chemistry
Main activities and responsibilities	Teaching and research in soil chemistry, environmental chemistry and soil science.
Name and address of employer	Department of Soil and Water, Adelaide University, Waite Campus, Glen Osmond, South Australia, 5064, Australia
Type of business or sector	Higher Education
Dates	August 1994 – July 1998
Occupation or position held	Lecturer in Environmental Chemistry
Main activities and responsibilities	Teaching and research in environmental chemistry, contaminated land and soil science.
Name and address of employer	School of Conservation Science, Bournemouth University, Talbot Campus, Fern Barrow, Poole, Dorset, BH12 5BB, UK.
Type of business or sector	Higher Education
Dates	Sept1993 – July 1994
Occupation or position held	Postdoctoral Research Fellow
Main activities and responsibilities	Research in fate and behaviour of metals in contaminated soils.
Name and address of employer	Department of Soil Science, University of Reading, Whitekinghts, Reading, Berks, UK.
Type of business or sector	Higher Education

Education and training

Dates	1990 - 1993
Title of qualification awarded	PhD
Principal subjects/occupational skills covered	Thesis title: Transfer and fate of heavy metals at historic metalliferous mine sites
Name and type of organisation providing education and training	Queen Mary and Westfield College, University of London, UK
Level in national or international classification	ISCED 6
Dates	1987 - 1990
Title of qualification awarded	BSc (2:i hons) Environmental Science
Principal subjects/occupational skills covered	Soil Science, Environmental Pollution, Hydrology
Name and type of organisation providing education and training	Queen Mary and Westfield College, University of London, UK
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s)	**English**
Other language(s)	

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
Language										
Language										

(*) Common European Framework of Reference for Languages

Social skills and competences

Interpersonal skills developed through presentation of research seminars, papers at international conferences. Teaching undergraduates and MSc. and presenting research material to school groups, members of the public, growers groups and agricultural bureau staff, potential industrial funders and senior Regulatory and Industry staff. Supervision of seven postgraduate students at Adelaide.

Organisational skills and competences

Programme management in my previous Regulatory role two high profile areas of work with significant cross-disciplinary involvement within the Environment Agency and externally with other governmental agencies and industry groups. These programmes specifically require reputation, budget, resource and people management to ensure the delivery of robust, useable and accepted outputs.

Laboratory Manager in the School of Conservation Sciences, responsible for the laboratory analytical facilities and the everyday running of the teaching laboratories including the management of 9 technical staff. Successfully completed Team Leader Development Programme in Environment Agency, including residential courses on People and Performance, Project Management, Time Management and Leadership.
Formerly secretary of South Australian Branch of the Australian Soil Science Society, member SETAC and elected to UK Council as publicity Officer, elected to the Committee for International Society for Trace Element Biochemistry for 2003-2005. Member of the British Society of Soil Science. Regular referee for technical papers and grant applications

Technical skills and competences

Direct experience in use of a range inorganic analytical tools, as well as routine chemical, mineralogical, pedological and other laboratory techniques including isotope dilution. Field based projects and glasshouse trials, setting up of field trials assessing the impact of contaminants on plant growth and other indicators of soil and environmental health. Risk based tools and techniques for chemicals, including assessment of ecotoxicology data and risk characterisation.

Computer skills and competences

MS Word, Excel

Driving licence

Full driving licence for cars

Additional information

Publications
Only the most recent papers and reports are listed here:

Merrington, G. and Smernik, R.J. (2004) Cadmium sorption in biosolids amended soils: results from a field trial. Science of the Total Environment. 327, 239-247.

Oliver, I.W., Merrington, G. and McLaughlin, M.J. (2004) Australian biosolids: Characterisation and determination of available copper. Environmental Chemistry. 1, 116-124.

Van Zwieten L., Rust, J., Kingston, T., Merrington, G. and Morris, S. (2004) Influence of copper fungicide residues on occurrence of earthworms in avocado orchard soils. Science of the Total Environment. 329, 29-41.

Oliver, W., Hass, A., Merrington, G., Fine, P. and McLaughlin, M.J. (2005) Copper Availability in Seven Israeli Soils Incubated with and without Biosolids. Journal of Environmental Quality. 34, 508-

Oliver, I.W., McLaughlin, M.J. and Merrington, G. (2005) Temporal trends of total and potentially available element concentrations in sewage biosolids: a comparison of biosolid surveys conducted 18 years apart. Science of the Total Environment, 337, 139-145.

Oliver, I.W., Merrington, G. and McLaughlin, M.J. (2006) Copper Partitioning Among Mineral and Organic Fractions in Biosolids. Environmental Chemistry, 3, 48–52.

Merrington, G (2006) The development and use of soil quality indicators for assessing the role of soil in environmental interactions. Environment Agency, Rio House, Bristol. 249pp. Science Report SC030265.

Grosso, A., Fishwick, S. and Merrington, G. (2007) United Kingdom Report on Soil Screening Values. Chapter in: Carlon, C. (Ed.) (2007) Derivation methods of soil screening values in Europe. A review and evaluation of national procedures towards harmonisation. European Commission, Joint Research Centre, Ispra. EU 22805-EN, pp231-241.

Special Issue of metals risk assessment in soils. Gorsuch, J., Merrington, G., Welp, G., Dwyer, R., Hennelly, M. and Schoeters. I. (2006) Assessing risks of metals added to soils in Europe and North America. Environmental Toxicology and Chemistry, 25, 631–634.

Merrington, G., Fishwick, S. and Brooke, D. (2006) The derivation and use of soil screening values for metals for the ecological risk assessment of contaminated land: a regulatory perspective. Land Contamination and Reclamation, 14,673- 684.

F. J. Zhao, McGrath, S. P. and Merrington, G. (2007) Estimates of ambient background concentrations of trace metals in soils for risk assessment. Environmental Pollution, 148:221-229.

Full CV available from: www.wca-environment.com

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Adam PETERS**
Address(es)	wca environment limited, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Telephone(s)	(+44 01555) 850107 Mobile: 07933 758810
Fax(es)	(+44 01555) 850107
E-mail	adam.peters@wca-environment.com
Nationality	British
Date of birth	29.09.1972
Gender	Male

Desired employment / Occupational field

ENVIRONMENTAL CONSULTANT (ENVIRONMENTAL CHEMISTRY)

Work experience

Dates	September 2007 - Present
Occupation or position held	Principal Consultant
Main activities and responsibilities	Technical responsibilities include direct work on environmental chemistry, risk assessment and environmental quality standards.
Name and address of employer	wca environment limited, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Type of business or sector	Environmental consultancy
Dates	January 2004 – August 2007
Occupation or position held	Principal Environmental Chemist (Position held at date of leaving)
Main activities and responsibilities	Provision of expert advice on chemical hazard and risk assessment, EQS development, chemical prioritization, behaviour and effects of trace metals and hazardous waste classification, project management and development and delivery of training materials.

Name and address of employer	Scottish Environment Protection Agency, 5, Redwood Crescent, East Kilbride, G74 5PP
Type of business or sector	Environmental Regulator
Dates	November 2001 – December 2003
Occupation or position held	Principal Chemicals Assessment Scientist
Main activities and responsibilities	management of environmental aspects of the Notification of New Substances scheme and the Existing Substances Regulations in the UK. Representation of the UK at EU technical meetings for New Substances, Existing Substances and Classification and Labelling (Environmental Effects).
Name and address of employer	Environment Agency, Evenlode House, Howbery Park, Wallingford, OX10 8BD
Type of business or sector	Environmental Regulator
Dates	February 2001 – November 2001
Occupation or position held	Post Doctoral Research Associate
Main activities and responsibilities	Researching the development of two dimensional QSARs to take account of both chemical properties and soil conditions in contaminated land assessment.
Name and address of employer	Department of Geological Sciences, University of Durham, Durham, UK
Type of business or sector	Research

Education and training

Dates	1995 - 1999
Title of qualification awarded	PhD
Principal subjects/occupational skills covered	Thesis title: A study of the binding of trace metals and radionuclides by humic substances
Name and type of organisation providing education and training	Institute for Environmental and Natural Sciences, University of Lancaster, Lancaster, UK
Level in national or international classification	ISCED 6
Dates	1992 - 1995
Title of qualification awarded	BSc (Hons) 2.1 Environmental Chemistry
Principal subjects/occupational skills covered	Environmental Chemistry, analytical chemistry
Name and type of organisation providing education and training	Environmental Science Department, University of Lancaster, Lancaster, UK
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s) **English**

Other language(s)

Self-assessment	Understanding		Speaking		Writing
European level (*)	Listening	Reading	Spoken interaction	Spoken production	

French	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user

(*) Common European Framework of Reference for Languages

Social skills and competences	Teamwork: I have worked in teams for most of my professional life; Presentation skills: I have made many oral presentations at national and international conferences and workshops to both technical and lay audiences. Chairing & negotiating skills: I have chaired sessions at expert workshops scientific meetings
Technical skills and competences	Environmental Chemistry and Risk Assessment: expertise gained from formal training, and practical experience as an environmental regulator.
Computer skills and competences	MS Word, Excel, Access; Use of models for chemical speciation, risk assessment and data estimation.
Driving licence	Full driving licence for cars.

Additional information

PUBLICATIONS

- Crane M., Fisher B., Leake C., Nathail P. Peters A., Stubblefield W. and Warn T (2007) How should an environmental standard be implemented? SETAC, Pensacola, USA (in preparation).
- MacGregor K. and Peters A. (2007) Distribution of Persistent Organic Pollutants (POP) in Eels (*Anguilla anguilla*) across Scotland. Scottish Environment Protection Agency, Stirling, UK.
- Peters A.(Rapporteur), Adams W, Diamond M., Davison W., DiToro D., Doyle P., Mackay D., Nriagu J., Ptacek C., Skeaff J., Tipping E., Waeterschoot H. (2006) Integrated Approach for Hazard Assessment of Metals and Inorganic Metal Substances: The Unit World Model Approach. in Assessing the Hazard of Metals and Inorganic Metal Substances in Aquatic and Terrestrial Systems. Adams W. and Chapman P. (Eds.) SETAC, Pensacola, USA.
- Peters A. (Chair), Smolders E., Allen H., Beauchemin S., Buvé L., Checkai R., Garett B., Groenenberg B. (Rapporteur), Hendershot W., Kwong J., Marsh M., Paktunc D., Rencz A., Sauvé S. (2005) The dynamics and long term fate of metals-in-soils: the role of geochemistry. In McGeer J., Skeaf J. & Rowsome S. Final Report from the International Workshop on Metals-in-Soils: Science Gaps and Regulatory Needs, Natural Resources Canada, Ottawa, Canada
- Peters, A., Zhang, H. and Davison, W. (2003) Investigation of the application of DGT devices for measurement of trace metals in low ionic strength freshwaters. Anal. Chim. Acta., 478, 237-244.
- Peters A., Tipping E. and Hamilton Taylor (2001) Americium binding to humic acid. Environ. Sci. Technol. 35, 3495-3500.
- Peters A. (1999) Trace metal binding by humic acid. Ph.D. Thesis, Lancaster University, Lancaster, UK.
- Lead J., Hamilton-Taylor J., Peters A., Reiner S and Tipping E. (1998) Europium binding by fulvic acids. Analytica Chimica Acta, Vol. 369, pp. 171-180.

KEY RECENT PROFESSIONAL EXPERIENCE

Implementation of Biotic Ligand Models for Cu and Zn in the compliance assessment of Environmental Quality Standards in the UK

Provision of training in chemical risk assessment to the Malaysian Department of the Environment, and provision of training in environmental chemistry to the Scottish Environment Protection Agency

Environmental risk assessment, EQS development, implementation and validation for trace metals, including UK representation under existing substances regulations and member of the Metals Environmental Risk Assessment Guidance (MERAG) Science Review Panel.

A UK representative at EU technical meetings on environmental risk assessment under the notification of new substances and existing substance regulations (Directive 98/8/EC).

Risk assessment of industrial chemicals in accordance with the EU technical guidance document.

Development and review of environmental quality standards for the protection of freshwater and marine ecosystems in accordance with current European guidance.

Hazard assessment and classification of waste materials and assessment of the recovery of resources from waste materials.

Full cv available at www.wca-environment.com

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Christopher WATTS**
Address(es)	wca environment limited, 69 Ormond Road, Thame, Oxfordshire, OX9 3XN, UK
Telephone(s)	(+44 01844) 216084 Mobile: 07739 213662
Fax(es)	(+44 01844) 216084
E-mail	chris.watts@wca-environment.com
Nationality	British
Date of birth	18.11.1951
Gender	Male

Desired employment / Occupational field

ENVIRONMENTAL CONSULTANT (ENVIRONMENTAL CHEMISTRY)

Work experience

Dates	June 2005 - Present
Occupation or position held	Director
Main activities and responsibilities	Technical responsibilities include direct work on, and supervision of, environmental chemistry and monitoring and environmental consultancy projects. Managerial responsibilities include staff and project management on technical projects.
Name and address of employer	wca environment limited, 23 London Street, Faringdon, Oxfordshire, SN7 7AG, UK
Type of business or sector	Environmental consultancy

Dates	July 1976 – May 2005
Occupation or position held	Principal Environmental Risk Assessor (Position held at date of leaving)
Main activities and responsibilities	Technical work on environmental monitoring and chemistry; project management; training and laboratory assessment.
Name and address of employer	WRc, , Frankland Road, Blagrove, Swindon, Wiltshire, SN5 8YF
Type of business or sector	Environmental consultancy

Education and training

Dates	1972 - 1975
Title of qualification awarded	PhD in Organic Geochemistry
Principal subjects/occupational skills covered	Thesis title: The Organic Geochemistry of Carotenoids and the Quincyte Pigments
Name and type of organisation providing education and training	University of Bristol, UK
Level in national or international classification	ISCED 6

Dates	1969 - 1972
Title of qualification awarded	BSc (2nd Class Hons) Chemistry
Principal subjects/occupational skills covered	Chemistry
Name and type of organisation providing education and training	University of Southampton, UK
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s) **English**

Other language(s)

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
French	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user
German	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user

(*) Common European Framework of Reference for Languages

Social skills and competences

Teamwork: I have managed or worked in teams for most of my professional life; I have contributed to committee work for government and professional societies (e.g., UK Health Advisory Group on Chemical Contamination Incidents, RSC Water Science Forum, BSI and ISO Committees).

Presentation skills: I have made many oral presentations at national and international conferences and workshops to both technical and lay audiences.

Chairing & negotiating skills: I have chaired committees and seminars for government, institutional and commercial clients

Organisational skills and competences

I was Managing Director of wca environment limited, responsible for organising budgets, staff and workloads. I managed a team of more than 30 postgraduate and postdoctoral staff when I was Environment Group Manager at WRc. I have set up and run several technical consortia to meet client needs.

Technical skills and competences	Environmental toxicology and chemistry: expertise gained from formal PhD training, and research and consultancy experience over a 30 year period. Environmental risk assessment: expertise gained from consultancy experience over a 25 year period.
Computer skills and competences	MS WORD, EXCEL, ACCESS. POWERPOINT, EXPLORER etc and numerous bespoke software packages such as EPIWIN, ChemDraw, TSAR, etc.
Driving licence	Full driving licence for cars

Additional information

Publications

- ALISTAIR B A BOXALL, QASIM CHAUDHRY, CHRIS SINCLAIR, ALAN JONES, ROB AITKEN, BRUCE JEFFERSON AND CHRIS WATTS (2007) Current and Predicted Environmental Exposure to Engineered Nanoparticles. Final Report to Defra.
- CHRIS WATTS (2006) Fate of Human Pharmaceuticals in the Environment. Presented at International Conference on Pharmaceuticals in the Environment. September 26-27, Amsterdam.
- CHRIS WATTS, MARK HUIJBREGTS AND PAUL RUMSBY (2005) Draft Environmental Burdens Research Programme (EBRP) Final Report on Hazardous Chemicals Equivalency Potential Development. Draft R&D Technical Report P6-015/TR6.
- WATTS, CD et al. (2003) Risk Assessment Report for Existing Substances. Methyl tertiary-Butyl Ether. Special Report No. 17. ECETOC, Brussels. ISSN-0773-6347-17.
- MARK TD CRONIN, JOANNA S JAWORSKA, JOHN D WALKER, MICHAEL HI COMBER, CHRISTOPHER D WATTS, ANDREW P WORTH (2003) Use of QSARs in international decision-making frameworks to predict health effects of chemical substances. Environmental Health Perspectives, 111:1391-1401.
- MARK TD CRONIN, JOANNA S JAWORSKA, JOHN D WALKER MICHAEL HI COMBER, CHRISTOPHER D WATTS, ANDREW P WORTH (2003) Use of QSARs in international decision-making frameworks to predict ecological effects and environmental fate of chemical substances. Environmental Health Perspectives, 111, 1376-1390.
- COMBER M H I, WATTS CD, HERMENS J, AND WALKER J D (2003) QSARs For Predicting Potential Ecological Risks Of Organic Chemicals. Environmental Toxicology and Chemistry. 22, 8, 1822-1828.
- WATTS CD el al. (2003) Development And Assessment Of Risk Profiles For Substances Used In Specific Industry Sectors – Plastics Additives And Lubricant Additives. Draft Final Report prepared for the UK Environment Agency.
- MITCHELL, R E AND WATTS, CD. Risk Assessment Report For Existing Substances - Propane, 2-methoxy-2-methyl- (CAS-No.: 1634-04-4), (2003), ECETOC Technical Report SR17.

Full cv available at www.wca-environment.com

Key Technical Experience:

- Current and Predicted Environmental Exposure to Engineered Nanoparticles
- Assessment of Persistence, Bioaccumulation and 'Equivalent Concern' aspects of Risk Assessment of Brominated Organics
- Chemical Safety Assessment of Heavy Fuel Oils and production of a Chemical Safety Report
- Development of a Chemicals Notification, Registration and Risk Assessment Strategy for the Malaysian Government (International Technical Expert)
- Risk assessments of 4-tert-pentylphenol and dinonylphenol (Project Manager)
- Prioritisation of Pharmaceuticals of Potential Environmental Concern (Project Area Manager)
- Environmental Risk Assessment of Gas Oils under the ESR Framework (Project Area Manager)
- Preparation of three review reports on the regulatory use of QSARs (Project Manager)
- Preparation of Risk Assessment Reports (RARs) for Alkylphenols (Project Manager)
- Production of a Full Environmental Risk Assessment for MTBE (Project Manager)
- A Review of the Persistence of Organic Compounds in the Environment (Project Manager)
- Review of Chemical Strategy for the EA(Technical Manager)

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Philip Copestake**
Address(es)	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Telephone(s)	020 8722 4701
Fax(es)	020 8722 4706
E-mail	philip.copestake@bibratoxadvice.co.uk
Nationality	British
Date of birth	29-09-61
Gender	Male

Desired employment / Occupational field

Chemical Toxicology

Work experience

Dates	2003-
Occupation or position held	Senior Toxicologist
Main activities and responsibilities	• Reviewing and critically evaluating toxicological data on a wide range of chemicals • Carrying out risk and hazard assessments for both industrial companies and Government departments • Writing evaluative summaries of key health related studies and associated legislation for the bibra Toxicology and Regulatory News, our in-house publication • Involvement in the drafting and peer-review of CICADs for IPCS, WHO.
Name and address of employer	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Type of business or sector	Toxicology Consultancy

Dates	1987 - 2002
Occupation or position held	Senior Toxicologist
Main activities and responsibilities	• Reviewing and critically evaluating toxicological data on a wide range of chemicals • Carrying out risk and hazard assessments for both industrial companies and Government departments • Writing evaluative summaries of key health related studies and associated legislation for the bibra Toxicology and Regulatory News, our in-house publication • Involved, from 1991-2000, in the production of the International Chemical Safety Cards (ICSCs), a project co-ordinated by the International Programme on Chemical Safety of the WHO, and served as a member of the Peer-Review Committee for this project. Recently has become involved in the drafting and peer-review of CICADs.
Name and address of employer	BIBRA International, Woodmansterne Road, Carshalton, Surrey SM5 4DS

Type of business or sector	Contract Research Organisation
Dates	1984-1985
Occupation or position held	Library Assistant – Erskine Medical Library
Main activities and responsibilities	Assisting with the day-to-day running of a busy medical library: issue desk activities; inter-library loans; answering user enquires
Name and address of employer	University of Edinburgh
Type of business or sector	Academia

Education and training

Dates	1998
Title of qualification awarded	EUROTOX Registered Toxicologist
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology
Level in national or international classification	ISCED 5

Dates	1998
Title of qualification awarded	Institute of Biology/British Toxicology Society Registered Toxicologist
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology/British Toxicology Society
Level in national or international classification	ISCED 5

Dates	1986
Title of qualification awarded	Master of Science in Information Sciences
Principal subjects/occupational skills covered	Information Sciences
Name and type of organisation providing education and training	The City University, London
Level in national or international classification	ISCED 5

Dates	1984
Title of qualification awarded	Bachelor of Science in Biological Sciences (with 2.1 Honours in Biochemistry)
Principal subjects/occupational skills covered	Biological sciences (specialising in molecular biology and biochemistry); chemistry; mathematics; statistics
Name and type of organisation providing education and training	University of Edinburgh
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s)	**English**									
Other language(s)										
Self-assessment	**Understanding**				**Speaking**				**Writing**	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
French	A1	Basic user	A1	Basic user	A1	Basic user	A1	Basic user	A1	Basic user

Language

(*) Common European Framework of Reference for Languages

Social skills and competences

- Friendly and supportive team player
- Firm but fair in the face of conflict
- Generous, honest and open when providing constructive feedback

Organisational skills and competences

- Extremely organised and methodical in approach to project work
- Patient and understanding when project managing projects and dealing with peer problems.

Computer skills and competences

- Good working knowledge of standard programs e.g. Microsoft Word, Excel, Outlook etc.
- Experience with numerous programs associated with chemistry/toxicology e.g. Classification & Labelling, production of MSDS, IUCLID etc.
- Expert in searching external databases

Additional information

- Experienced at giving external presentations (such as on the derivation and use of the Acceptable Daily Intake, and the use of information resources in toxicology), for example as part of the Modular Training Programme in Applied Toxicology (Design of In Vivo Studies) course at the University of Surrey (also acting as an external examiner), and as part of the medical information course of the Information Science MSc at The City University, London.
- Author of chapter Information Resources for Toxicology. In: General and Applied Toxicology, Ballantyne et al. (Eds)
- Published articles on a range of toxicological issues and on the efficacy of toxicity databases

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Tanya Diver**
Address(es)	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Telephone(s)	020 8722 4701
Fax(es)	020 8722 4706
E-mail	tanya.diver@bibratoxadvice.co.uk
Nationality	British
Date of birth	23-06-62
Gender	Female

Desired employment / Occupational field

Chemical Toxicology

Work experience

Dates	2003-
Occupation or position held	Senior Toxicologist
Main activities and responsibilities	• Reviewing and critically evaluating toxicological data on a wide range of chemicals • Carrying out risk and hazard assessments for both industrial companies and Government departments • Writing and/or peer-reviewing evaluative summaries of key health related studies and associated legislation for the bibra Toxicology and Regulatory News, our in-house publication • Writer and/or peer-reviewer of numerous literature reviews for Health Canada • Author of many evaluative reviews for industry
Name and address of employer	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Type of business or sector	Toxicology Consultancy
Dates	1987 - 2002
Occupation or position held	Senior Toxicologist

Main activities and responsibilities	• Reviewing and critically evaluating toxicological data on a wide range of chemicals • Carrying out risk and hazard assessments for both industrial companies and Government departments • Preparation and peer reviewing of animal feed additives dossiers • Writing evaluative summaries of key health related studies and associated legislation for the bibra Toxicology and Regulatory News, our in-house publication • Monitoring proposed changes to UK/EU/International legislation controlling chemicals and chemical products, writing up any interesting developments for Toxicology and Regulatory News. • Involvement in the setting up of an internationally-renowned, in-house, computerised toxicological database, in 1986, and assisting in its subsequent development
Name and address of employer	BIBRA International, Woodmansterne Road, Carshalton, Surrey SM5 4DS
Type of business or sector	Contract Research Organisation
Dates	1984
Occupation or position held	Graduate Trainee in Information Science
Main activities and responsibilities	Writing abstracts of coal research papers
Name and address of employer	IEA Coal Research
Type of business or sector	Research
Dates	1983-1984
Occupation or position held	Part-time Research Assistant
Main activities and responsibilities	Working on bird behaviour.
Name and address of employer	Oxford University Zoology Department
Type of business or sector	Academia
Dates	1983-1984
Occupation or position held	Part-time Tutor
Main activities and responsibilities	Tutoring student up to A-level standard in Biology
Name and address of employer	Cherwell Tutorial College, Oxford
Type of business or sector	Academia

Education and training

Dates	1998
Title of qualification awarded	EUROTOX Registered Toxicologist
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology
Level in national or international classification	ISCED 5
Dates	1998
Title of qualification awarded	Institute of Biology/British Toxicology Society Registered Toxicologist
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.

Name and type of organisation providing education and training	Institute of Biology/British Toxicology Society
Level in national or international classification	ISCED 5
Dates	1985
Title of qualification awarded	Master of Science: Information Science (with Distinction)
Principal subjects/occupational skills covered	Information sources, information retrieval and operational systems, techniques of searching, effective report writing, biomedical and pharmaceutical information handling, introduction to computers and programming, bibliometrics
Name and type of organisation providing education and training	The City University, London
Level in national or international classification	ISCED 5
Dates	1983
Title of qualification awarded	Bachelor of Arts [Honours (Oxon) Zoology (2.1)]
Principal subjects/occupational skills covered	Biology, chemistry, biochemistry, ecology, entomology, animal behaviour and maths
Name and type of organisation providing education and training	Somerville College, Oxford University, Oxford
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s) **Specify mother tongue** (if relevant add other mother tongue(s), see instructions)

Other language(s) **German & French**

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
German	A1	Basic user	B1	Independent user					A1	Basic user
French	A1	Basic user	A2	Basic user					A1	Basic user

(*) Common European Framework of Reference for Languages

Social skills and competences
- Good learner's attitude combined with enthusiastic and positive outlook
- Friendly and supportive team player

Organisational skills and competences
- Good coordinator of projects
- Keen eye for detail
- Excellent at meeting deadlines

Technical skills and competences

Computer skills and competences
- Good computing skills and familiarity with Microsoft Office programs, particularly Word, Excel and Outlook
- Expert in searching external databases
- Was involved in the setting up of an internationally-renowned, in-house, computerised toxicological database, in 1986, and assisted in its subsequent development.

Additional information	Co-authored a book entitled “The status of alternative methods in toxicology” (under maiden name of Russell) published in 1995 by the Royal Society of Chemistry.

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**James Hopkins**
Address(es)	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Telephone(s)	020 8722 4701
Fax(es)	020 8722 4706
E-mail	james.hopkins@bibratoxadvice.co.uk
Nationality	British
Date of birth	17-04-52
Gender	Male

Occupational field

Chemical Toxicology

Work experience

Dates	2003 to date
Occupation or position held	Managing Director
Main activities and responsibilities	• Managing Director of two toxicology consultancy companies: leading, training and supervising teams of scientists on toxicological projects. • Reviewing and critically evaluating toxicological data on a wide range of chemicals. • Carrying out risk assessments for both industrial companies and governmental departments. • Compilation of critical reviews of chemicals in the Canadian environment for Health Canada, and peer-review of many other reports on their behalf.
Name and address of employer	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Type of business or sector	Toxicology consultancy
Dates	1979-2002
Occupation or position held	Head of Information and Advisory Services
Main activities and responsibilities	• Head of a large department providing toxicological advice to a large number of companies from a wide range of industrial sectors • Reviewing and critically evaluating toxicological data on a wide range of chemicals. • Carrying out risk assessments for both industrial companies and governmental departments. • Contributor of key sections of the BIBRA Toxicology and Regulatory News.
Name and address of employer	BIBRA International, Woodmansterne Road, Carshalton, Surrey SM5 4DS
Type of business or sector	Contract Research Organisation
Dates	1976-1979

Occupation or position held	Toxicologist, Information Department
Main activities and responsibilities	• Reviewing and critically evaluating toxicological data on a wide range of chemicals. • Carrying out risk assessments for both industrial companies and governmental departments. • Contributor of key sections of the BIBRA Toxicology and Regulatory News.
Name and address of employer	BIBRA, Woodmansterne Road, Carshalton, Surrey SM5 4DS
Type of business or sector	Contract Research Organisation
Dates	1974-1976
Occupation or position held	Polymer Research Chemist
Main activities and responsibilities	
Name and address of employer	British Petroleum Company, Sunbury and Burgh Heath, Surrey
Type of business or sector	Petroleum company
Dates	1970-1974
Occupation or position held	Sponsored Student, Kingston Polytechnic, London
Main activities and responsibilities	
Name and address of employer	British Petroleum Company, Sunbury and Burgh Heath, Surrey
Type of business or sector	Petroleum company

Education and training

Dates	1998
Title of qualification awarded	EUROTOX Registered Toxicologist
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology
Level in national or international classification	ISCED 5
Dates	1997
Title of qualification awarded	Institute of Biology/British Toxicology Society Registered Toxicologist
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology/British Toxicology Society
Level in national or international classification	ISCED 5
Dates	1974
Title of qualification awarded	Bachelor of Science, with First Class Honours, in Chemistry
Principal subjects/occupational skills covered	Chemistry
Name and type of organisation providing education and training	Kingston Polytechnic
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s) **English**

Other language(s) **French**

Self-assessment	Understanding		Speaking		Writing	
European level (*)	Listening	Reading	Spoken interaction	Spoken production		
French					A1	Basic user

(*) Common European Framework of Reference for Languages

Social skills and competences
- Friendly and supportive team player
- Firm but fair in the face of conflict; generous, honest and open when providing constructive feedback

Organisational skills and competences
- Strong leader with high level motivational and organisational abilities
- Good learner's attitude combined with enthusiastic and positive outlook

Computer skills and competences
- Competent in all aspects of database searching for toxicological data
- Computer literate with good knowledge of a range of Microsoft Office programs

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Peter Watts**
Address(es)	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Telephone(s)	020 8722 4701
Fax(es)	020 8722 4706
E-mail	pete.watts@bibratoxadvice.co.uk
Nationality	British
Date of birth	10-02-54
Gender	Male

Desired employment / Occupational field

Chemical Toxicology

Work experience

Dates	2003-
Occupation or position held	Director of Toxicology
Main activities and responsibilities	• Responsibility for project management and peer-reviewing of in-house projects. • Responsibility for training less-experienced toxicologists, and advising on CPD activities. • Reviewing and critically evaluating toxicological data on a wide range of chemicals. • Responsibility for ensuring currency on tools for data identification and (Q)SAR. • Carrying out hazard and risk assessments for both industrial companies and governmental departments. • Contributor of key sections of bibra Toxicology and Regulatory News, a monthly current awareness publication on toxicology and related legislation. • WHO Temporary Advisor (attended several CICADs FRB meetings).
Name and address of employer	bibra – toxicology advice & consulting, Westmead House, 123 Westmead Road, Sutton SM1 4JH, UK
Type of business or sector	Toxicology Consultancy
Dates	1981-2002
Occupation or position held	Senior Toxicologist, Information & Advisory Service

Main activities and responsibilities	• Responsibility for project management and peer-reviewing of in-house projects. • Identification reviewing and critically evaluating toxicological data on a wide range of chemicals. • Carrying out hazard and risk assessments for both industrial companies and governmental departments. • Contributor of key sections of BIBRA Toxicology and Regulatory News. • Scientific Editor of BIBRA Toxicology and Regulatory News. • Chemical Safety Officer.
Name and address of employer	BIBRA International, Woodmansterne Road, Carshalton, Surrey, SM5 4DS
Type of business or sector	Scientific Research and Contract Organisation
Dates	1977-1981-
Occupation or position held	Research Officer, Biological Chemistry Department
Main activities and responsibilities	• Development of analytical techniques. • Analysis of a wide range of media e.g. rodent diet, drinking water, biological fluids and tissues.
Name and address of employer	BIBRA International, Woodmansterne Road, Carshalton, Surrey, SM5 4DS
Type of business or sector	Scientific Research and Contract Organisation

Education and training

Dates	1999
Title of qualification awarded	EUROTOX Register of Toxicologists
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology
Level in national or international classification	ISCED 5
Dates	1998, successful re-registration in 2003
Title of qualification awarded	Institute of Biology/British Toxicology Society Registered Toxicologist
Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology/British Toxicology Society
Level in national or international classification	ISCED 5
Dates	1975
Title of qualification awarded	Bachelor of Science, with Honours, in Chemistry [followed by Cert Ed in 1976]
Principal subjects/occupational skills covered	Chemistry
Name and type of organisation providing education and training	University of Exeter
Level in national or international classification	ISCED 5

Personal skills and competences

Mother tongue(s) **English**

Other language(s) **French**

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
French	A1	Basic user	B1	Intermediate user	A1	Basic user	A1	Basic user	A1	Basic user

(*) Common European Framework of Reference for Languages

Social skills and competences

- Good learner's attitude combined with enthusiastic and positive outlook
- Friendly and supportive team player; firm but fair in the face of conflict

Organisational skills and competences

- Strong leader with high level of motivational and organisational abilities
- Generous, honest and open when providing constructive feedback
- Good communicator
- Able to work independently
- Strongly capable of resisting influence from clients who may have their own agenda.

Technical skills and competences

- Highly competent at finding, interpreting, and summarising complex toxicity data sets
- High-quality risk assessor.

Computer skills and competences

- Good computing skills and familiarity with Microsoft Office programs, particularly Word, Excel, Outlook and PowerPoint

Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	**Paul George BRANTOM**
Address(es)	Brantom Risk Assessment Ltd 15 Campbell Road, Maidenbower Village, Crawley, West Sussex RH10 7GY, UK
Telephone(s)	+44 (0)1293 873546 Mobile: +44 (0)7740 945 855
Fax(es)	
E-mail	paul@brantom.net
Nationality	British
Gender	Male

Desired employment / Occupational field

Toxicology

Work experience

Dates	2004-
Occupation or position held	Consultant in toxicology and toxicological risk assessment.
Main activities and responsibilities	• Providing assistance to companies and organisations requiring review and analysis of toxicological data. Projects have included industrial chemicals, speciality chemicals, consumer products, pesticides, food additives and food contact materials. The work is carried out both for regulatory purposes and also for commercial decision-making. • Providing supervision of programmes of toxicology working as interface between the client and external contract laboratory.
Name and address of employer	Brantom Risk Assessment Ltd
Type of business or sector	Toxicology Consultancy
Dates	October 2002- March 2004
Occupation or position held	Head of Department - Toxicology and Information Services
Main activities and responsibilities	• Managing of a team of people providing risk assessment services to government and industrial clients. • Provided consultancy and project management support to companies and projects.
Name and address of employer	BIBRA International, Woodmansterne Road, Carshalton, Surrey SM5 4DS, UK
Type of business or sector	Contract Research Organisation
Dates	1999- October 2002
Occupation or position held	Departmental Head

Main activities and responsibilities	• Responsible to the Executive Director, for a staff of around 30 • Member of the laboratory Management Group with responsibility for delivering a total company budget of around £3 million • Responsible for development of desk-based toxicology services and conduct of regulatory toxicology studies.
Name and address of employer	TNO BIBRA, Woodmansterne Road, Carshalton, Surrey SM5 4DS, UK
Type of business or sector	Contract Research Organisation
Dates	1992-1999
Occupation or position held	Head of Division – Customer and Information Services
Main activities and responsibilities	• Line management responsibility for around 40 staff including animal unit, project management, Information/advisory, Editorial and Marketing/Sales • Responsible for Project Management system including appointment and training of all Study Directors • Responsible for ensuring compliance of study conduct with GLP, Home Office licences and animal welfare • Co-ordination of all toxicology project discussions including BIBRA Management signoff of protocols and reports. Includes the provision of guidance and consultancy to customers regarding the most appropriate solution to their needs • Development of all aspects of BIBRA business in line with customer needs • Co-ordination of all BIBRA Sales and Marketing activity • Member of the BIBRA animal Care and Welfare Committee • Member of the Management Group and the Executive board of BIBRA
Name and address of employer	BIBRA, Woodmansterne Road, Carshalton, Surrey SM5 4DS, UK
Type of business or sector	Contract Research Organisation
Dates	1969-1992
Occupation or position held	1989 - 1992 Senior Manager - Contracts 1985-1989 Study Director and Marketing co-ordinator 1982-1985 Secondment at MAFF and Dept of Health 1979-1982 Safety evaluation section-leader 1977-1979 Senior Study Director 1972-1977 Manager Nitrosamine dose-response study 1969-1972 Training and project manager
Main activities and responsibilities	As indicated by job title shown above
Name and address of employer	BIBRA, Woodmansterne Road, Carshalton, Surrey SM5 4DS, UK
Type of business or sector	Contract Research Organisation

Education and training

Dates	1999
Title of qualification awarded	Member of BIRA
Principal subjects/occupational skills covered	
Name and type of organisation providing education and training	British Institute for Regulatory Affairs
Level in national or international classification	ISCED 5
Dates	1997
Title of qualification awarded	Institute of Biology/British Toxicology Society Registered Toxicologist

Principal subjects/occupational skills covered	Candidate must demonstrate that appropriate scientific meetings have been attended, participation at pertinent continuing personal development courses and that a sufficient amount of relevant toxicological literature has been studied over a five-year period.
Name and type of organisation providing education and training	Institute of Biology/British Toxicology Society
Level in national or international classification	ISCED 5
Dates	1988
Title of qualification awarded	MCIM (Member of the Chartered Institute of Marketing)
Principal subjects/occupational skills covered	
Name and type of organisation providing education and training	Chartered Institute of Marketing
Level in national or international classification	ISCED 5
Dates	1988
Title of qualification awarded	DipM (Diploma in marketing)
Principal subjects/occupational skills covered	
Name and type of organisation providing education and training	Chartered Institute of Marketing
Level in national or international classification	ISCED 5
Dates	1983
Title of qualification awarded	PhD
Principal subjects/occupational skills covered	Toxicology
Name and type of organisation providing education and training	University of Surrey
Level in national or international classification	ISCED 6
Dates	1976
Title of qualification awarded	MIBiol
Principal subjects/occupational skills covered	
Name and type of organisation providing education and training	Institute of Biology
Level in national or international classification	ISCED 5
Dates	
Title of qualification awarded	BSc (Hons) (Bachelor of Science with Honours)
Principal subjects/occupational skills covered	Zoology
Name and type of organisation providing education and training	Leeds University

Level in national or international classification: ISCED 5

Personal skills and competences

Mother tongue(s): **English**

Other language(s): **French**

Self-assessment	Understanding				Speaking				Writing	
European level (*)	Listening		Reading		Spoken interaction		Spoken production			
Language										
Language										

(*) Common European Framework of Reference for Languages

Social skills and competences
- Good teamworker, is a valuable member of a number of UK and European Scientific Committees
- Excellent presentational skills

Organisational skills and competences
- Good communicator
- Good eye for detail
- Strongly capable of resisting influence from clients who may have their own agenda

Technical skills and competences
- Highly competent at finding, interpreting, and summarising complex toxicity data sets
- High-quality risk assessor.

Computer skills and competences
- Extremely computer literate with expertise in a range of Microsoft Office programs and website production

Additional information

Professional expertise and membership of UK and European Committees

I have been a member of the UK Veterinary Products Committee since January 2002 (renewed 2005) and have been the FSA nominated representative on the Veterinary Residues Committee since April 2001(renewed 2005) and was appointed vice-chair in 2007. I was appointed to the Advisory Committee on Animal Feedingstuffs (ACAF) in October 2002 (renewed 2005) and was appointed to the ACAF GM sub-group in April 2003. I have been a member of the EFSA advisory Panel on additives to animal feeds (FEEDAP) since May 2003 (renewed June 2006). (I am also a member of EFSA Working Groups on Genotoxic carcinogens (completed), GM products in Food and Feed and Benchmark dose). I was appointed to the Advisory Committee on Novel Foods and Processes (ACNFP) in July 2006.

Other work-related activities

- 1986 Selected by UNIDO for a 1 month assignment in South Korea assisting the establishment of a National Toxicology Centre
- 1988 - 2003 Involved with the IPCS of WHO in a project preparing International Chemical Safety Cards. As a previous chairman of the Peer-review group for these cards I have also participated in the steering Committee to guide this project.
- 1994 -1998 Involved in validation studies of alternatives to the Draize eye irritation test both with EU and the UK Home Office and the European Cosmetics Trade Association (COLIPA)
- 1994 - Present Provide support to numerous ECVAM validation projects
- 1990 - Present Working as a consultant on regulatory submissions for various companies including a long-standing programme with some Japanese clients.
- 1995 Invited by the National Institute of Health Science in Tokyo to present views on chemical safety data to a chemical Industry forum

Annexes

List of Publications

Publications authored or co-authored by Dr Paul Brantom

1. Gaunt, I.F., Brantom, P.G., Kiss, I.S., Grasso, P. & Gangolli, S.D. (1971). Short-term toxicity of Orange RN in rats. Fd. Cosmet. Toxicol. 9, 619.
2. Brantom, P.G., Gaunt, I.F., Grasso, P., Lansdown, A.B.G. & Gangolli, S.D. (1972). Short-term toxicity of tolualdehyde in rats. Fd. Cosmet. Toxicol. 10, 637.
3. Gaunt, I.F., Brantom, P.G., Grasso, P., Creasey, M. & Gangolli, S.D. (1972). Long-term feeding study on Chocolate Brown FB in rats. Fd. Cosmet. Toxicol. 10, 3.
4. Gaunt, I.F., Brantom, P.G., Kiss, I.S., Grasso, P. & Gangolli, S.D. (1972). Short-term toxicity of Acetoin (Acetylmethylcarbinol) in rats. Fd. Cosmet. Toxicol. 10, 131.
5. Brantom, P.G., Gaunt, I.F. & Grasso, P. (1973). Long-term toxicity of sodium cyclamate in mice. Fd. Cosmet. Toxicol. 11, 735.
6. Brantom, P.G., Gaunt, I.F., Hardy, J., Grasso, P. & Gangolli, S.D. (1973). Long-term feeding and reproduction studies on Emulsifier YN in rats. Fd. Cosmet. Toxicol. 11, 755.
7. Gaunt, I.F., Brantom, P.G., Grasso, P. & Kiss, I.S. (1973). Long-term toxicity studies of Chocolate Brown FB in mice. Fd. Cosmet. Toxicol. 11, 375.
8. Lake, B.G., Brantom, P.G., Gangolli, S.D., Butterworth, K.R. & Grasso, P. (1976). Studies on the effects of orally administered di-(2-ethylhexyl) phthalate in the ferret. Toxicology 6, 341.
9. Brantom, P.G., Gaunt, I.F. & Hardy, J. (1977). One-year toxicity study of Orange G in the ferret. Fd. Cosmet. Toxicol. 15, 379.
10. Lake, B.G., Brantom, P.G., Gangolli, S.D., Butterworth, K.R., Grasso, P. & Lloyd, A.G. (1977). The hepatic effects of orally administered di-(2-ethylhexyl) phthalate in the ferret. Biochem. Soc. Trans. 5, 310.
11. Brantom, P.G. (1983). Dose-response relationships in nitrosamine carcinogenesis. PhD Thesis, University of Surrey.
12. Peto, R., Gray, R., Brantom, P.G. & Grasso, P. (1984). Nitrosamine carcinogenesis in 5120 rodents : chronic administration of control and 15 different concentrations of NDEA, NDMA, NPYR and NPIP in the water of 4440 inbred rats with parallel studies on NDEA alone of the effect of age of starting (3, 6 or 20 weeks) and of species (rats, mice or hamsters). In: N-NITROSO COMPOUNDS : OCCURRENCE, BIOLOGICAL EFFECTS AND RELEVANCE TO HUMAN CANCER. I.K. O'Neill, R.C. Von Borstell, C.T. Miller, J. Long & H. Bartsch eds. International Agency for Research on Cancer, Lyon. IARC Scientific Publications No. 57, pp 627-665.
13. Brantom, P.G., Stevenson, B.I. & Ingram, A.J. (1987). A three-generation reproduction study of Ponceau 4R in the rat. Fd. Chem. Toxic. 25, (12), 963.
14. Brantom, P.G., Stevenson, B.I. & Wright, M.G. (1987). Long-term toxicity study of Ponceau 4R in rats using animals exposed in utero. Fd. Chem. Toxic. 25, (12), 955.
15. Brantom, P.G., Creasy, D.M. & Gaunt, I.F. (1987). Long-term toxicity study of Green S in mice. Fd. Chem. Toxic. 25, (12), 977.
16. Mangham, B.A., Moorhouse, S.R., Grant, D., Brantom, P.G. & Gaunt, I.F. (1987). Three-generation toxicity study of rats ingesting Brown HT in the diet. Fd. Chem. Toxic. 25, (12), 999.
17. Peto, R., Gray, R., Brantom, P. & Grasso, P. (1991). Effects on 4080 rats of chronic ingestion of N-nitrosodiethylamine or N-nitrosodimethylamine: A detailed dose-response study. Cancer Res. 51, (23), 6415.
18. Peto, R., Gray, R., Brantom, P. & Grasso, P. (1991). Dose and time relationships for tumor induction in the liver and esophagus of 4080 inbred rats by chronic ingestion on Nnitrosodiethylamine on N-nitrosodimethylamine. Cancer Res. 51, (23), 6452.
19. Gray, R., Peto, R., Brantom, P. & Grasso, P. (1991). Chronic nitrosamine ingestion in 1040 rodents: The effect of the choice of nitrosamine, the species studied, and the age of starting exposure. Cancer Res. 51, (23), 6470.
20. Purchase R., Ford, G.P., Creasy, D.M., Brantom, P.G. & Gangolli, S.D. (1992). A 28-day feeding study with methyl isoeugenol in rats. Fd. Chem. Toxic. 30, (6), 475.
21. Cook, W.M., Purchase, R., Ford, G.P., Creasy, D.M., Brantom, P.G. and Gangolli, S.D.(1992) A 28-day feeding study with ethyl acetoacetate in rats. Food and Chemical Toxicology 30,7, 567-573
22. Robbins, M.C., Petterson, D.S. and Brantom, P.G. (1996). A 90-Day Feeding Study of the Alkaloids of Lupinus angustifolius in the Rat. Food and Chemical Toxicology, 34,8, 679-686
23. Smith, J.H., Mallett, A.K., Priston, R.A.J., Brantom, P.G., Worrell, N.R., Sexsmith, C. & Simpson, B.J. (1996). Ninety-day feeding study in Fischer 344 rats of highly refined petroleum-derived food-grade white oils and waxes. Toxicol Pathol 24(2):214-230
24. Brantom, P.G., Aspin, P. & Thompson, C. (1995). Supply, Coding and Distribution of Samples for Validation Studies. ATLA. 23, 348.
25. Lewis, D.F., Brantom, P.G., Ioannides, C., Walker. R., Parke, D.V. (1997) Nitrosamine carcinogenesis: rodent assays, quantitative structure-activity relationships, and human risk assessment.Drug Metab Rev 29(4),1055-1078
26. Brantom, P.G., Bruner, L.H., Chamberlain, M., De Silva, O., Dupuis, J., Earl, L.K., Lovell, D.P., Pape, W.J.W., Uttley, M., Bagley, D.M., Baker, R.W., Bracher, M., Courtellemont, P., Declercq, L., Freeman, S., Steiling, W., Walker, A.P., Carr, G.J., Dami, N., Thomas, G., Harbell, J., Jones, P.A., Pfannenbecker, U., Southee, J.A., Tcheng, M., Argembeaux, H., Castelli, D., Clothier, R., Esdaile, D.J., Itigaki, H., Jung, K., Kasai, Y., Kojima, H., Kristen, U., Larnicol, M., Lewis, R.W., Marenus, K.,

Moreno, O., Peterson, A., Rasmussen, E.S., Robles, C. & Stern, M. (1997). A summary report of the COLIPA international validation study on alternatives to the Draize eye irritation test. Toxicology in Vitro 11, 141-179.
27. Barrat, M.D., Brantom, P.G., Fentem, J.H., Gerner, I., Walker, A.P. and Worth A.P. (1998) The ECVAM International validation study on in vitro tests for skin corrosivity 1. Selection and distribution of the test chemicals. Toxicology in Vitro 12, 471-482
28. Spielmann H., Balls, M., Dupuis, J., Pape, W.J.W., Pechovitch G., de Silva O., Holzhütter H.--G., Clothier R., Desolle P., Gerberick F., Liebsch M., Lovell W.W., Maurer T., Pfanenbecker W., Potthast J.M., Csato M., Sladowski D., Steiling W. and Brantom P. (1998) The international EU COLIPA phototoxicity validation study: results of Phase II (blind trial). Part 1: the 3T3 NRU phototoxicity test. Toxicology in Vitro 12. 305-327
29. Pessina, A., Albella, B., Bueren, J., Brantom, P., Casati, S., Gribaldo, L., Croera, C., Gagliardi, G., Foti, P. and Parchment, R. (2001) Prevalidation of a model for predicting acute neutropenia by colony forming unit granulocyte/macrophage (CFU-GM) assay. Toxicology in Vitro, 15 (6), 729-740
30. Pessina A, Albella B, Bayo M, Bueren J, Brantom P, Casati S, Croera C, Parchment R, Parent_Massin D, Schoeters G, Sibiri Y, Van Den Heuvel R, Gribaldo L (2002) In vitro tests for haematotoxicity: prediction of drug-induced myelosuppression by the CFU-GM assay. Altern Lab Anim Dec 30 Suppl 2: 75-9
31. Scotter, M. J., Castle, L. Massey, R. C., Brantom, P. G. and Cunninghame, M. E. (2003) A study of the toxicity of five mineral hydrocarbon waxes and oils in the F344 rat, with histological examination and tissue-specific chemical characterisation of accumulated hydrocarbon material. Food and Chemical Toxicology 41, 489-521
32. Pessina A, Albella B, Bayo M, Bueren J, Brantom P, Casati S, Croera C, Gagliardi G, Foti P, Parchment R, Parent-Massin D, Schoeters G, Sibiril Y, Van Den Heuvel R, Gribaldo L (2003) Application of the CFU-GM assay to predict acute drug-induced neutropenia: an international blind trial to validate a prediction model for the maximum tolerated dose (MTD) of myelosuppressive xenobiotics. Toxicol Sci Oct 75:355-67