General notes

1. The first stage of the ROAME (Rationale, Objectives, Appraisal, Monitoring, Evaluation) process requires a clear and succinct statement of the commissioning organisation’s rationale for funding research. The SID 1 provides the customer’s reasons for requiring research in a particular policy area and the policy and scientific objectives of that research. It forms the basis for all research proposals and is vital to ensure overall direction and ultimate evaluation of the research programme.

2. The level at which the SID 1 statement is set is for the policy customer to decide. Each Programme should focus on one or more related policy objectives and the related scientific objective(s). However, policy customers may wish to set SID 1 statements at a higher level, e.g. where a large research programme addresses similar policy and scientific objectives.

3. The SID 1 is an important working document, which stems from and supports Defra’s Evidence and Innovation Strategy. All SID 1s will be published and used to inform contractors and other funders of research of the rationale and key policy drivers underpinning Defra’s research programmes.

4. A SID 1 must be produced for each research programme. It should be approved at Director level, or at a lower level only through formal delegation of authority. Science Units within Defra are responsible for ensuring that all research is commissioned and contracted under a SID 1 which complies with this guidance. A SID 1 should typically be no more than 5-6 pages long, although this can vary depending on the complexity and size of the programmes covered.

5. SID 1s should be reviewed every 3-5 years. If new or revised forms are produced (for example, following a review), these should annex the original form to provide a historical record of programme change. Please refer to the Science Handbook for further guidance.

6. This form is in Word format and the boxes may be expanded, or reduced, as appropriate.

1. Area of Policy/Research

Please state the title of the proposed research programme – including FPS Programme Code Assessment Unit or Sub-Programme Code.

**BEE HEALTH is part of AF:090***

* AF090 covers Plant Health and Bee Health, which are both the responsibility of Plant Health Division. AF090 is run as a joint Programme and funds are not ring fenced for either Plant Health or Bee Health, but allocated according to priorities.

This Bee Health ROAME replaces the ROAME covering Bee Health research entitled Effective Disease Control with Minimal Environment Impact produced in 2003 by the Sustainable Farming, Food and Fisheries Science Division. The Bee Health ROAME reflects the Policy Rationale, Policy Objectives and Science Objectives outlined in the Bee Health Strategy published for consultation on 8th April of 2008. It also outlines the planned processes for Appraisal, Monitoring and Evaluation.

Following the consultation and agreement with Ministers this will be used as the basis for commissioning future Bee Health Research.
2. RATIONALE for Defra Funding

(a) Describe the policy problems to be addressed by this research.

Honey bees (*Apis mellifera*) make an important contribution to local food production and also to diversity in the natural environment by carrying out pollination. However, they are susceptible to both exotic and endemic pests and diseases, the likelihood and/or consequences of which have increased significantly in the UK over the last 5 to 10 years (for example, Small hive beetle, *Tropilaelaps* spp., foul broods and Varroa species). Threats to the sustainability of honey bees in the UK also include the potential arrival of undesirable species such as Asian hornets which prey on honey bees.

In the first instance, management of pests and diseases is the responsibility of beekeepers. However, beekeeping is mainly a hobbyist activity dominated by non-commercial beekeepers and this particular characteristic presents difficulties for safeguarding bee health, as without specialist support their investment in the required measures to promote or manage bee health or to collaborate effectively with other beekeepers to address common problems is likely to be limited. These difficulties are compounded because many beekeepers are not members of any beekeeping associations, making them difficult to reach. Furthermore, the beekeeping associations have limited resources and capacity.

As a result of these difficulties, concerted initiatives and actions to sustain honey bees, such as detecting and eradicating exotic pests and diseases or reducing national levels of endemic pests and diseases, are difficult to undertake and unlikely to be effective without government support. At the very least, centralised management is needed to maintain uniform standards of pest and disease control and enforcement.

The primary aims of the Defra Bee Health Programme are to protect and improve the health of honey bees in England and Wales by, among other things:

- Effective biosecurity to minimise risks from pests, diseases and undesirable species;
- Good standards of beekeeping and husbandry to minimise pest and disease risks and contribute to sustaining honey bee populations;
- Keeping impacts from pest, diseases and other hazards to the lowest levels achievable;

See Bee Health Strategy for further details

Bee Health policy and its delivery, through the inspection and monitoring services provided by the NBU, tends to focus on detailed technical issues associated with statutory requirements and other serious disease risks including development of diagnostic methods and management tools.

Research to underpin bee health policy and operations is therefore mainly highly applied and problem solving in nature and normally targeted at specific pests or diseases. Outputs from the R&D programme also provide the basis for training delivered by the Bee Inspectors and beekeeping associations on pest and disease recognition as well as how to manage infected colonies.

(b) Explain how the research will support Defra Strategic Priorities, PSA targets and Evidence and Innovation Strategy.
Defra's Strategic Priorities

The work on Bee Health and the underpinning research programme contribute to two of Defra’s eight Departmental Strategic Objectives for 2008-2011:

- A thriving farming and food sector with an improving net environmental impact.
- A healthy, resilient, productive and diverse natural environment.

This work will also contribute towards the delivery of the Government’s cross-departmental Public Services Agreement for the natural environment:

- “to secure a diverse, healthy and resilient natural environment, which provides the basis for everyone’s well-being, health and prosperity now and in the future; and where the value of the services provided by the natural environment are reflected in decision-making”.

Defra’s Evidence and Innovation Strategy (E&IS)

Bee Health’s E&IS needs were incorporated into the wider Sustainable Farming and Food E&IS consultation document. Some parts of the broader Defra E&IS Consultation document (2005) are also relevant, especially those areas concerned with Protecting the Countryside and Natural Resource Protection. Evidence and Innovation needs include the research that is required to support policy and operations; this ROAME therefore directly underpins the E&IS needs of Bee Health (see E&IS graphic in Bee Health Strategy).

Bee Health Research Supporting Defra’s Strategic Priorities, PSA Targets and E&IS

The work of the Bee Health research programme closely links to two of Defra’s Strategic Priorities by (a) improving the welfare of kept animals and (b) by improving the local environment and safeguarding biodiversity. This is achieved by preventing the introduction and spread of exotic pests and diseases and helping to control certain serious endemic pests and diseases. Defra’s Plant Health Division (PHD) has policy responsibility for Bee Health in England and Wales and co-ordination of UK policy on Bee Health and its negotiation in international fora. The National Bee Unit (NBU) executes this policy in England, and through an MOU with the Welsh Assembly Government, and it carries out surveillance for pests and diseases, inspections and diagnostics, treatment or destruction of infected hives, checks on imports and assists the beekeeping sector in controlling pests and diseases by providing training and guidance.

PHD is responsible for the commissioning and management of a scientific research and development (R&D) programme. The research is closely aligned to the work of the Division and NBU and supports the scientific services provided by the NBU, which is part of Defra’s Central Science Laboratory (CSL).

The Research directly supports Bee Health policy, operations and Defra’s wider objectives by: (a) developing diagnostic and monitoring tools which support the effort to exclude or contain exotic pests and diseases which are a threat to UK apiculture; (b) developing approaches to support eradication and containment for notifiable pests and diseases and management of certain serious endemic pests and diseases; and (c) providing data to support the development of optimal and evidence-based policy, e.g. providing biological information that informs UK policy and supports pest risk analysis (both risk assessment and risk management).

(c) Explain how this research will be co-ordinated with other Defra science and policy activity. This should cover co-ordination with other Defra research programmes, including economic, social science and the Horizon Scanning Programme and other Defra science activity, e.g. monitoring and surveillance programmes.
The Programme will align with the following Defra research programmes and will aim to be complementary to these and, where possible and appropriate, engage in co-funding activities:

- **Defra Food and Farming Group:** we will collaborate and coordinate our research with other programmes within the Food and Farming Group.
- **Defra Chief Scientific Adviser’s Group:** we will collaborate or coordinate with Defra CSA on more strategic projects in particular with respect to cross-departmental projects where there is a Bee Health interest and any Defra Horizon Scanning initiatives related to Bee Health. Currently there is the ‘Biochip’ project which is producing microarrays for infectious viruses including bee viruses (SD0443).
- **Other Defra departments:** we will coordinate any PHD-funded research with Defra departments funding research on other issues which may affect honeybees. Currently there are projects being funded by the Environmental Stewardship department, the Pesticides Safety Directorate and the Veterinary Medicines Directorate.

The Programme will also align with several Non-R&D programmes, including:

- **Defra Bee Health Science Programme:** The research programme to a very large extent underpins the science provision (diagnostics and consultancy) provided by the NBU under a Non-R&D MoU with Plant Health Division.
- **Defra CSL Horizon Scanning and Future Proofing Programme:** This HSFP programme is funded from the PHD-CSL Non-R&D MoU. It anticipates and supports future Plant Health and Bee Health science and policy needs, investigates the potential of new or novel scientific approaches, technologies or opportunities and enhances the provision of scientific knowledge and services by enabling new research outputs to be transferred into routine use. CSL is the programme owner, but topics are aligned closely with the research programme through dual oversight by PHD’s Science Management Workstream (see Section 5).
- **NBU Surveillance Programmes:** Much of the research directly supports the operations carried out by the National Bee Unit.

Commissioning of social-scientific research is limited due to the applied nature of the programme. However, some strategic research could be funded which looks at non-traditional approaches to solving problems using social scientists although this is more likely to be funded by other departments. In addition if a more formal approach to risk assessment is established for bee health this could include some socio-economic elements.

(d) Explain how the proposed programme will align with the work of other Departments and funders of research. This should cover UK funders and, where possible or appropriate, funders in other countries or international bodies; whether co-ordination is needed or foreseen and, if so, how and when such co-ordination or collaboration should take place.

The Programme will align with the following non-Defra research programmes and will aim to be complementary to these and, where possible, engage in co-funding activities:

- **The EU and Individual European Countries:** where appropriate we aim to coordinate our research programme with EU-funded Bee Health research, e.g. the 7th Framework Programme, providing matched funding for EU projects as appropriate and as resources allow. We will also ensure that our Programme of Bee Health research has synergy with research funded by other European countries. This will optimise resources and reduce duplication. Where appropriate, we will also engage in research which supports wider Bee Health collaboration within Europe, examples might include research to ensure that all diagnostic laboratories have the capabilities required for detecting and diagnosing exotic pests and diseases.
- **Other Government Programmes:** we will coordinate our programme with those of other Government Departments where appropriate, e.g.: The Scottish Government; The Welsh Assembly Government; and The Northern Ireland Department of Agriculture and Rural Development.
- **UK Research Funders’ Forum:** a UK Research Funders’ Forum has recently been established which includes industry representatives (Bee Farmers’ Association, British Bee Keepers’ Association, Welsh Bee Keepers’ Association) members of the
appropriate Research Councils (e.g. BBSRC, NERC), and members of other Defra departments funding research on honeybees (e.g. PSD, VMD). Representatives from relevant levy bodies may be included at a later date. This group aims to discuss priorities for bee research and approaches for collaborative funding, if appropriate, to commission research using combined resources from forum members.

- **Other International Bodies**: where appropriate we will ensure our research is complementary and aligned to other international research, e.g. US federal and state research.

(e) Provide a brief summary as to why Defra should fund the proposed research. You are required to justify the use of Defra resources for the proposed project. In your justification you should clearly set out that no other existing or current research or body of information meets the policy needs; why R&D is the most suitable method to provide evidence; and the intended outcome of the programme.

Section 2 (a) sets out the policy problem.

Government has a clear regulatory role and in addition there are also international obligations. The development of evidence-based regulatory policy requires research to provide underpinning data; similarly policy implementation (i.e. operations) requires research to provide the necessary tools to manage bee pests and diseases of concern, including the provision of tools for surveillance/monitoring and for managing/controlling exotic pests and diseases when introduced. There are also some serious non-notifiable pests and diseases that require government support in terms of their control. This is necessary because of the hobbyist nature of the industry and will be done for the public good with a view to sustaining honey bees.

The research outputs are intended to directly support policy and operations to protect Bee Health in England and Wales. No other research programme currently meets the identified Bee Health policy and science needs.

### 3. OBJECTIVES

(a) State policy objectives which should be:

- achievable;
- testable (i.e. in a form capable of verification, preferably in a quantitative fashion); and
- time-bound (i.e. to be reached at a pre-determined date).

Three of the Strategic Outcomes detailed in the Bee Health Strategy are supported by the research programme and these are:

- Effective biosecurity minimises pest and disease risks
- Good standards of beekeeping and husbandry minimise pest and disease risks and contribute to sustaining honey bee populations
- Impacts of pests, diseases and other hazards are kept to lowest levels achievable

### 3. OBJECTIVES continued

(b) State scientific objectives which must be achievable, verifiable and timebound.

Science staff must decide where research can contribute to the achievement of policy objectives and agree with Policy DGs scientific objectives appropriate to meet the policy need. They should also cover the key deliverables against which the success of the programme will be judged at review:
• anticipated contribution to Defra policy development (i.e. to inform change of policy);
• other outputs, such as new or refined industry practices/standards;
• planned processes for Knowledge Transfer and Innovation and communication to the public.

The scientific objectives listed here will contribute to the achievement of the policy objectives listed in section 3(a):

• **To develop, as required, new diagnostic methods which are sensitive and robust for the detection and identification of exotic pests and diseases and other serious endemic pests and diseases, including, as appropriate, on-site methods.**
  o Develop novel methods as required, refine and improve current methods, test methods with validated or certified material.
  o Extend the range of methods available for detection of pests and diseases. The majority of methods currently available are molecular allowing lab-based diagnosis of submitted samples but detection in the field would be useful for both beekeepers and bee inspectors, for example using Lateral Flow Devices (LFDs).
  o Consider developing methods which allow simultaneous screening for several pests and diseases.
  o Collect further DNA sequence information for bee pests and diseases to distinguish between closely-related species that affect bees and which can be used for novel method development.

• **To improve the understanding of exotic pests and diseases and develop methods for optimal eradication or containment strategies.**
  o Review the information available on the factors affecting pest spread and disease epidemiology and on pest/disease control, identify gaps and carry out research to fill these gaps.
  o Ensure capability in bee health science, e.g. consolidate the existing contractor, assess opportunities for expanding the contractor base and award fellowships as appropriate.
  o Improve linkages/synergies within the EU, e.g. FP7 opportunities for collaborative scientific projects.
  o **To investigate control methods that can be used for managing serious endemic pests and diseases including novel husbandry techniques and methods that can be used as part of Integrated Pest Management (IPM) approaches.**
    o Assess both chemical and biological control methods for managing bee pests and diseases, review the work that has been done to date, consider the potential for developing methods which are effective in the field and carry out research as required.
    o Develop novel husbandry techniques (shook swarm, different hive structures) for maintaining bee health and managing bee pests and diseases.
    o Consider other tools that could be used for improving bee health including breeding for resistance or developing molecular markers to screen for susceptibility/resistance to diseases.
  o **To provide data by research to identify and assess threats to Bee Health in England and Wales including exotic pests and diseases, invasive competitor species, undesirable predator species and environmental health hazards, in order to determine their impact on apiculture and inform policy. Work might also consider the development of pest risk assessment methodologies for Bee Health.**
    o Develop the science of pest risk assessment with respect to bees and which includes economic and environmental analysis as well as pest risk management.
Explain your plans to ensure that you obtain fit for purpose research under this programme and value for money for the taxpayer. In particular, how will you ensure expert external input and challenge (e.g. through advice from expert groups/committees; peer review of project proposals; and level of competitively let contracts) are taken into account.

**Fit for Purpose**

Since the resources for Bee Health research are limited, most research is anticipated to be let non-competitively. Applied work on exotic pests or work that directly underpins the NBU science programme is anticipated to be primarily let directly with CSL. Other work, for instance on strategic aspects or on endemic pests and diseases or in areas where CSL does not have specific capability may be let to other research providers via non-competitive or competitive processes.

The Programme is overseen by PHD’s Science Management Workstream (SMW) which is an overarching Programme and Project Management (PPM) group. This ensures that the science needs are met and integrated and that the research is fit for purpose.

The SMW is responsible for keeping the ROAME under review and for initiating the commissioning of research. Research needs are identified through pro-active consultation within the wider policy division, the National Bee Unit including both scientists and the Bee Health Inspectorate, and with other stakeholders. In response to the National Audit Office report (NAO Report HC1186, October 2003) and subsequent Public Accounts Committee report (PAC 44th Report, HC 208, 2004) on ‘Protecting England Wales from plant pests and diseases’, a series of Plant Health Taxonomic Fellowships have been funded. Under the Bee Health R&D programme there is scope to commission taxonomic fellowships in Bee Health to underpin policy by: (a) ensuring the availability of UK taxonomic expertise (succession planning and gap filling); and (b) providing the basic taxonomic knowledge needed to underpin the Bee Health research and science programmes.

The SMW also considers how independent experts and stakeholders should be utilised in the development of the research programme and in the identification of both operational and strategic science needs, in line with the Science Advisory Council’s recommendations (SAC Report on Science into Policy). Specific external stakeholder and scientific review is facilitated during reviews of the Programme, approximately every 5 years.

Input is also obtained via Steering Groups which comprise end-users of the research, as well as industry stakeholders as appropriate. Steering Groups are established for all projects and typically comprise one person from the policy division (PHD), one person from the NBU (Bee Inspectorate and/ or scientific end user), and industry stakeholder representatives where appropriate. Steering Groups review proposals before commissioning to ensure they are ‘fit for purpose’ and also oversee progress after commissioning.

All project proposals over £250k are also peer reviewed and other projects over £50k–£70k per year may also be peer reviewed in the interests of best practice. Peer reviews include an assessment of how well the proposals address Defra’s wider objectives and those of Bee Health specifically.

Although research is commissioned within the framework of the ROAME statement, the PHD business plan and PHD’s evidence and innovation needs for Bee Health, PHD may also consider longer-term availability of skills and capability when commissioning research. However, projects are never commissioned solely for this purpose but must fall within the ROAME statement and deliver to identified policy or science needs, in line with Science Advisory Council recommendations.

**Value for Money and Quality**

Use of single tender bids from limited numbers of preferred research providers are considered the best way to ensure and maintain a critical mass of expertise in bee health. Competitively let research for some areas of work allows the contractor base to be expanded and access to other expertise.

For competitive research, standard evaluation criteria for proposals typically include value for money and a measure of whether the research meets the Programme objectives. For non-competitive research, there are a number of preferred research providers with expertise related to bee health. Since the majority of research commissioned by PHD is very applied and directly underpins the Bee Health science programme delivered by the CSL NBU, much of the non-competitive work is let here.
Value for money and quality of CSL research is assessed to a large degree as part of their 5-yearly science audits. The high level of technology transfer and information transfer from CSL research teams to the National Bee Unit contributes to ensuring good value for money.

All research contractors have to indicate that they are compliant with the Defra Joint Code of Practice for Research (JCOP). This is assessed by visits by the Scientific Adviser and/or through contractor updates/reports on JCOP implementation. This process helps ensure the quality of research outputs.

We also plan to engage pro-actively with other research funders to make better use of limited resources. Projects maybe co-funded synergistically with other funding bodies, especially: the European Union (e.g. Framework Programmes); other Defra Research Programmes; beekeeping associations/organisations; levy bodies, e.g. The Horticultural Development Council (HDC); The Scottish Government; and The Welsh Assembly Government. Co-funding or collaboration opportunities could also be explored with research councils and potentially with non-UK/EU funders. We will also investigate the potential for collaboratively funding research projects through the UK Research Funders’ Forum.

5. MONITORING

Please explain how you plan to monitor progress against programme and project objectives, in particular any key programme review points.

Plant Health Division operates a Programme and Project Management (PPM) system. Within this, a Science Management Workstream (SMW) is responsible for overseeing Science issues, including the Research Programme. It is chaired by the Research Programme Manager and comprises policy representatives (Head of Plant Health and the Heads of Branches), the Plant Health and Seeds Inspectorate (Chief PHSI) and Defra’s Central Science Laboratory (Head of Plant Health Group in which the NBU is based). A specific Bee Health Workstream also considers Bee Health research issues and feeds into the SMW. The SMW has a remit to guide and oversee Plant Health and Bee Health science/research strategy and science quality issues, as laid down in a framework document that outlines the basis and modus operandi for managing its science-based issues, specifically:

- To establish and keep under review the Plant Health and Bee Health ROAME statement and a ‘Plant Health and Bee Health’ Evidence and Innovation Strategy.
- Under the ROAME, to determine and keep under review the content of the Plant Health and Bee Health research programme, in consultation with other policy makers, inspectorates, scientists and stakeholders as appropriate. Also, to ensure that the content meets wider policy and science objectives, e.g. that it accounts for recommendations from the National Audit Office and Public Accounts Committee that relate to science capability and taxonomic expertise.
- To ensure appropriate linkages with other R&D projects, programmes or initiatives from other funding bodies or organisations.
- To oversee and approve the annual CSL Horizon Scanning and Future Proofing (HSFP) programme (funded under the PHD-CSL Non-R&D MoU).
- To oversee research quality issues, including: evaluation processes; membership and the functioning of Steering Groups; appraisal and quality of research projects and reports; compliance by contractors with the Defra Joint Code of Practice (JCOP); review and implementation of Defra quality principles for research (e.g. Defra Science Handbook and SAC Report on Quality Assurance).
- Oversight of ‘Science into Policy’ issues, including the appropriate implementation of the SAC Science into Policy recommendations.

We also aim to have an external review of the research programme approximately every 5 years, amending the ROAME accordingly. In between reviews, stakeholder input is also facilitated through the normal lines of communication and this is taken into account when considering specific project commissioning. This also includes inputs from any policy consultations, reviews or challenges, including those via Government Chief Scientific Advisers (e.g. Defra/OSI).

At the Project level, all PHD-funded projects are overseen by a Steering Group, as outlined above. These monitor progress against the programme and project objectives. Steering Groups meet with
the Project Leader at least once a year, review appraisals of annual reports done by the Defra Project Officer and assess proposed changes to projects.

The Plant Health Taxonomic Fellowship Programme and its on-going projects are reviewed annually during a specific review day alongside CSL’s Plant Health and Bee Health Horizon Scanning and Future Proofing Programme (HSFP).

6. EVALUATION

Please specify how you intend to evaluate the outputs of the programme against its objectives, ensuring appropriate external input and challenge. This should also include an assessment of the future of the programme.

Project reports are required annually and are appraised by the Defra Project Officer. Appraisals and reports are reviewed by Steering Group members for approval/comment. The appraisals include a policy interpretation of the results, separate to the policy interpretation provided by the researchers. The quality of the science and also the impact/value to policy are assessed. Reports and appraisals are signed off by the Head of the Policy Unit (PHD) and final reports are placed on the external Defra website science pages. Report appraisals are provided to the research contractors as part of best practice and to provide feedback.

Increasingly, we also consider peer reviewing the final reports for larger projects, especially: those that are more strategic in nature; those that may warrant follow-on work; and those providing data that underpin regulation and key policy decisions.

Research outputs are integrated into policy processes and consultations. In particular data on specific pests are incorporated within guidance made available to stakeholders and the public via the National Bee Unit Website (http://beebase.csl.gov.uk/) and through training/advice to beekeepers via the Bee Health Inspectorate. For specific policy consultations, research results that underpin policy making or decisions are identified either within accompanying risk assessments or in Regulatory Impact Assessments (RIA).

The outputs of the programme are also specifically evaluated approximately every 5 years during the external review of the programme, which also assesses future direction.

In the case of research commissioned with Defra’s Central Science Laboratory the outputs are evaluated during the 5-yearly Science Audits, the last being in 2006.

This research programme will be reviewed by (insert year) 2013

Approved by

Date

Name

Dr Stephen Hunter

Unit

Deputy Director (Plant and Bee Health)