Sheep Dip Strategy

R&D Technical Report P237

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In-House Authors

Research Contractor:
Environment Agency

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Statement of use
This Technical Report describes a strategy for the control of sheep dip pollution, which has been devised by the Environment Agency following extensive external and internal consultation exercise. It will be considered by the Environment Protection Function for adoption as firm Environment Agency policy. It will be of interest to Environmental Protection staff and others outside the Agency involved in sheep treatment using dip chemicals.

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EXECUTIVE SUMMARY

Introduction

Over the last few years the Environment Agency has become increasingly concerned about the risks of water pollution arising from sheep treatment and disposal of treatment chemicals. Recent surveys in remote rural areas have shown that pollution, arising from poorly practiced sheep dipping is widespread. A large number of pollution incidents have occurred in in catchments supporting salmon rivers. The reasons for the apparent increase in incidents and decline in water quality resulting from pollution by sheep treatment chemicals have been attributed largely to the shift from organophosphate (OP) based compounds to those using synthetic pyrethroids (SP) as the active ingredient.

Factors associated with pollution from sheep treatment chemicals are widespread use of soakaways to dispose of spent solutions, poor practice and poor facilities. A related issue is the losses of sheep treatment chemicals from the textile industry through wool processing and fell-mongering which have led to frequent Environmental Quality Standard failures in rivers.

Whilst the Agency follows a rigourous enforcement regime which has led to a number of prosecutions for incidents involving sheep dip it would prefer to prevent pollution by working with the industry before environmental damage occurs. In the light of this and the recently introduced Groundwater Regulations, the Agency considers it opportune to produce a strategy to deal with Sheep Treatment. Initial work was carried out by ADAS to review current practices and identify where improvements could be made (R&D Technical Report P-170). In doing this, the review recognised the current economic difficulties of the sheep farming industry in the UK and the need to maintain its long term viability. The ADAS report was put out to widespread consultation in July and August 1998.

The Strategy

This strategy, based on R&D Technical Report P-170 and the views of consultees, identifies and recommends a number of actions that could be taken to reduce the risks of water pollution from sheep treatment. These include the potential for education and guidance, the legislative framework, the disposal of used dip, toxicity reduction methods on farm, waste minimisation and improved flock management, the authorisation and supply of sheep treatment compounds, the textile industry, monitoring, and the possible outcomes from the reform of the EC Common Agricultural policy.

The Way Forward

The recommendations, along with timescales and the stakeholders who can assist in their successful are summarised in the final chapter of the strategy. Reductions in risks to the water environment

will only be brought about with the full support of sheep farmers and related organisations as well as Government departments and agencies. Many of the recommendations are straightforward and can be achieved by the Agency. However, others require refinement and further debate with individuals and organisations to set common goals. The Agency will continue dialogue with those identified in the report to achieve environmental improvements. It is hoped that all of those associated with the sheep farming industry will take ownership of the issues and address the environmental concerns within the framework of needing to maintain the industry's viability.

KEY WORDS:

Sheep dipping compounds; agriculture; groundwater pollution; freshwater pollution; veterinary medicine; organophosphate; synthetic pyrethroid; agricultural waste management; textile industry.

1 INTRODUCTION

1.1 Background

The Environment Agency (The Agency) has been concerned for some time about the risk of water pollution arising from sheep dipping and the disposal of sheep dip compounds. Research by the National Rivers Authority (NRA) into the disposal of sheep dips revealed that surface waters could be severely affected, albeit relatively infrequently and that in some locations there was a significnt risk of pollution of ground water, particularly when soakaways were used for disposal (Blackmore and Clarke, 1994). Parallel work in Scotland revealed significant water pollution problems arising from poor practice by sheep dippers, and this was particularly evident in catchments supporting salmon (Virtue and Clayton, 1997, Morris 1998). Recent Agency monitoring of smaller streams in remote rural areas has shown that pollution from sheep dipping is far more widespread than previously indicated by reported pollution incident data.

The widespread concern over the health risks to users of organophosphate (OP) pesticides may have contributed to a major shift from OP based dips towards the use of synthetic pyrethroid (SP) products during the mid 1990s. These SP compounds were perceived to be less hazardous to sheep dip operators, but it was not widely appreciated that they can be up to 100 times more toxic to aquatic life than OP compounds. Only very small volumes of SP compounds are needed to cause serious pollution; initially, a factor not fully realised by the farming community. Increased numbers of pollution incidents were reported and several serious cases of pollution involving SP dip compounds were recorded during 1996.

1.2 Production of a Strategy

In response to these incidents and the shift to greater use of SP compounds, the Agency instigated surveys in North West, North East, Midlands and Welsh Regions. The findings mirrored the Scottish situation with widespread sheep dip pollution being found in the smaller streams. These streams are known to be important as breeding grounds and nursery areas for migratory salmonid fish (salmon and sea trout). In Wales it is estimated that over 700km of rivers were affected in 1997 (Environment Agency, 1998) whilst in the North West region pollution incidents affected 200 km of rivers with individual incidents resulting in damage to invertebrate life along significant lengths of rivers. In total 34 pollution incidents were associated with sheep dipping were recorded in 1997.

A separate issue was identified when improved sewage treatment facilities in Midlands and North East Regions failed to bring about expected improvements in river quality. One cause was identified as pesticide pollution arising from wool processing, either from sheep dip residues on fleeces and hides, or from moth proofing agents used in carpet manufacture. Residues of these products were passing through the treatment process in sufficient concentrations to exceed environmental quality standards and directly impact upon a number of sensitive biological species in the river downstream of the works.

Whilst the Agency follows a rigorous enforcement regime resulting in more prosecutions for pollution incidents involving sheep dip, it would prefer to prevent pollution by working with the farmer before pollution occurs and before there is damage to the environment. In June 1997, therefore, the Agency began a nationwide publicity campaign to raise awareness of the issue and promote good practice. It met farming representatives to address jointly the problems, whilst instigating monitoring programmes and pollution prevention campaigns in catchments areas most badly affected. It was recognised that the absence of an overall strategy for dealing with, or protecting the water environment from sheep dip chemicals prevented substantial progress. The Agency had no effective input into the changing technology associated with the on farm treatment of sheep dip solutions and similarly, it has no real way of dealing with other changing practices such as the increase in the numbers of sheep dipped by mobile contractors, greater use of 'pour-ons' and jetting or showering equipment or the increased use of SP dip compounds. For the purposes of this report the wide range of externally applied insecticides and their residues that are used to combat ectoparasites on sheep are referred to as "sheep dip" unless otherwise stated.

In early 1998, therefore, the Agency commissioned ADAS to write R&D Technical Report P170 - "A Strategic Review of Sheep Dipping" (1998), to assist with the production of an overall strategy to deal with the sheep dipping issue. It is intended that this strategy will reduce the risks to and actual environmental damage resulting from the use of various externally applied sheep treatments whilst not interfering with the viability of the sheep farming industry.

1.3 Consultation to Produce the Strategy

Production of a comprehensive strategy required extensive consultation with organisations and individuals involved in sheep dipping. The initial consultation was carried out by ADAS as part of the review outlined above and it collated available information, identified problem areas and potential solutions in order to produce its report. This enabled the Agency to obtain a wide range of views and to identify areas of conflict prior to sending out the report for formal consultation. Twenty two organisations were sent the report at the end of July 1998, with further individuals and organisations being able to obtain copies on request. In addition relevant Agency Committees were invited to comment. The Government's OP Committee was also provided with a copy of the report. The organisations and individuals invited to comment are listed in Appendix 1. The level of response was high and the initiative received widespread support. Especially welcome, was the high degree of support and positive suggestions from the farming organisations and those representing environmental interests which has enabled the Agency to formulate this strategy.

Given the common concerns of the Agency and the Scottish Environment Protection Agency (SEPA) close collaboration has continued throughout the project.

1.4 Implementation of the Strategy

The Agency recognises that all elements of a comprehensive strategy cannot be implemented immediately so key components of the strategy take into account what can be achieved in the short, medium and longer term. The key recommendations and actions that constitute the strategy are highlighted throughout the text and are summarised in Chapter 12 together with target implementation dates. The Agency also recognises the need to be flexible in implementing the strategy, especially when working with others, and will amend the timing of actions as appropriate.

2 EDUCATION AND GUIDANCE

2.1 Code of Practice

Widespread acceptance of and adherence to good quality guidance is essential to safeguard the health of operators, water supplies and the environment. Agency investigations have shown poor awareness of, and compliance with existing voluntary Codes of Practice (COPs) (MAFF 1991, 1998) and guidance for protection of the environment. The Agency notes the useful research by MAFF in 1996 on the general use and uptake of its COPs. One finding was that farmers who did possess copies of the COPs demonstrated a higher level of understanding on the need to protect the environment.

Education and clear guidance are seen as being essential elements in improving sheep treatment practices and environmental protection.

The consultation exercise suggested that a sheep dipping COP for environmental protection could provide such guidance. The Agency received widespread support for a comprehensive COP provided that it consolidated existing codes or guidance and did not introduce contrary guidance or undermine guidance relating to operator health. Any COP will therefore need to be well presented, technically and legally sound and widely available to both sheep farmers and those involved in the treatment, transport and sale of sheep.

The Groundwater Regulations 1998 [SI 2746] make specific provision for statutory COPs to be used to control activities such as sheep dipping and such COPs have to be approved by Ministers.

The Agency fully accepts that a code as advocated in report P170 must be consistent with and complement any statutory COPs for the Groundwater Regulations, existing MAFF/SAC Codes and AS29 Sheep Dipping (HSE, 1998).

Recommendation 1

It is proposed that a comprehensive Code of Practice for the protection of the environment from the control of ectoparasites in sheep be produced, which includes, in full, any relevant Statutory Code of Practice for the Groundwater Regulations.

Such a COP will be produced in close consultation with the DETR, MAFF and other Government Departments, agencies, farming organisations as well as industry and include:

- storage of treatment chemicals;
- design, construction , siting and use of all sheep ectoparasite treatment systems and associated drainage areas or handling pens;
- disposal of unwanted or used treatment chemicals;

- requirements to protect surface waters and the environment as a whole, which may not be included as part of any Code for the Groundwater Regulations;

- management of freshly dipped sheep;

- "on-farm" management techniques to help reduce the frequency and degree of infestation and consequent dependence on treatment systems;

- methods to reduce volumes of used sheep dip;

- "off-farm" management techniques to minimise the risk of infestation, including transportation of sheep to and from grazing pastures, abattoirs and markets, and practices at markets themselves; and

- the use of "withdrawal periods" and other methods between dipping and shearing/slaughter to reduce effluent discharges via sewerage systems.

2.2 Mobile Contractors

Report P170 identified that mobile contractors are now responsible for treating a substantial proportion of the national flock and it is generally accepted that this proportion may increase over the next few years. In addition, there is an increasing tendency for farmers to purchase mobile equipment for their own use and to hire it out.

Mobile treatment presents different risks to the environment than static facilities. Their mobility provides a wide choice of sites providing the opportunity for site selection that can help minimise risks of pollution. However cases of pollution have been recorded and the general lack of adequate drain down areas associated with mobile dips, make post-dipping management of sheep crucially important. The Agency is also concerned about poor practices relating to the disposal of spent dip from mobile facilities.

Exact numbers are unknown, but there are thought to be between 150 and 200 mobile contractors operating in England and Wales.

It has been suggested that a national register could be set up of accredited mobile contractors who have demonstrated their competence to carry out all aspects of the dipping and disposal operation. Such a register could also provide a route for the dissemination of appropriate guidance. This would need the support of the industry and a further evaluation of the envrionmental and other benefits of such an accreditation scheme needs to be made.

Recommendation 2

The Agency will initiate discussions with mobile contractors and their representatives to evaluate the benefits of an accreditation scheme.

Recommendation 3

It is essential that all users of mobile dipping equipment are given clear guidance on its safe use by the suppliers and manufacturers.

Recommendation 4

It is recommended that where farmers employ mobile contractors both parties fully consider their respective environmental responsibilities.

2.3 Site Visits/Provision of Guidance

Whilst face to face communication is preferred, given the very large number of sheep farmers the Agency will not, on its own, be able to visit all such farmers in the foreseeable future and initially will attend in high risk catchments or where invited. However, guidance could, potentially, be provided by other groups including:

- ADAS - as part of the MAFF/WO farm visit programme;
- manufacturers, suppliers, either face to face, via "education packs" or as part of their product literature;
- other organisations such as farming unions, NSA, HSE, VMD, NOAH;
- veterinary surgeons; and
- agricultural merchants and suppliers.

Recommendation 5

The Agency will work closely with key agricultural industry groups to ensure they are familiar with the Agency's aims and the need to protect the environment so they can provide complementary guidance, consistent with the proposed Code of Practice.

2.4 Certificate of Competence

The NPTC Certificate of Competence in the Safe Use of Sheep Dips, was developed to meet the requirements of the Medicines (Veterinary Drugs), (Pharmacy and Merchants List) Amendment Order 1994. From 1st April 1995 it became illegal to sell OP dips, except to holders of the Certificate of Competence (CoC). The CoC records that on the date of the last assessment, the holder was competent in the use of sheep dips, showers etc. including:

- preparation before dipping;

- work during and after dipping;

- safe use and disposal;

The Agency therefore fully supports the principles of the CoC in helping reduce risks to the environment. The Agency had, however, been concerned that the CoC did not cover SP dips or the use of dips. ADAS identified these shortfalls in report P170, highlighting that only a quarter of sheep farmers with large flocks hold a certificate. The CoC has recently been amended and the Agency views the extension to include the purchase of SP dips as a significant step forward. The Agency accepts that there is no legal requirement for all those involved in dipping to be required to hold a certificate, but recommends that:-

Recommendation 6

whenever treatment is undertaken using externally applied insecticides, at least one person at the treatment site has a full CoC, or is able to demonstrate a similar level of competence, and remains on site throughout the treatment process.

In addition all persons involved in dipping have at least attended the first part of the CoC or equivalent and those involved in treatment and disposal of used dip should be suitably trained.

2.5 Pollution Prevention and Public Relations Campaigns

In response to increasing numbers of pollution incidents, poor practices and poor understanding of the risks to the environment associated with SP compounds in particular, the Agency commenced a sheep dip campaign in June 1997.

This was repeated in 1998, but started earlier and involved closer working with the industry. The Agency received positive support from MAFF, the NSA and farming unions and this was important in improving awareness by farmers, especially of the risks from SP compounds. These campaigns appear to have been reasonably successful with Agency and SEPA staff noting better awareness amongst some farmers.

Recommendation 7

The Agency intends to run a substantial sheep dip campaign in 1999, again working closely with key groups to promote this strategy and an understanding of the Groundwater Regulations.

3 THE LEGISLATIVE FRAMEWORK

3.1 General

Sheep treatment activities are subject to several areas of current legislative control, including health and safety, water pollution, animal husbandry and transport. The Water Resources Act 1991 already gives powers to the Agency to prosecute retrospectively for pollution where sheep dip chemicals have **caused** or been **knowingly permitted** to enter **controlled waters** (essentially all surface freshwater and groundwater), and to authorise, by consent, discharges from any **building or fixed plant**. However, in practice, the environmental legislation dealing with the pollution impacts of sheep treatment on the water environment has been very limited. For instance, at present, a farmer does not need any authorisation or be required to notify the Agency when installing a dipping facility, using it or when disposing of the spent dip solution onto land.

The Agency wishes to move away from reacting after the event, when the environment has already been damaged, to a more proactive and preventative role, and will be helped in achieving this through the recent introduction of the **Groundwater Regulations 1998** [SI 2746]. These Regulations extend control to the discharge, disposal or tipping of materials such as sheep dip onto or into the land where groundwater is present. Such activities require an **authorisation** which is issued by the Agency.

The Regulations provide powers to prevent pollution of groundwaters, with listed substances, by the issuing of an authorisation or by the issuing of a notice to bring about improvement. These powers will come fully into force on 1 April 1999 and it is anticipated that Works Notice provisions of the Water Resources Act (1991) will also be implemented in 1999 and enable the Agency to protect more fully surface waters as well. These new powers will allow the Agency to serve Works Notices on, for example, sheep dipping baths in a poor state of repair, or located too close to a watercourse, or which discharge via drain holes.

Recommendation 8

The Agency will enforce the Groundwater Regulations in line with its enforcement and prosecution policy in order to prevent and minimise the risks of pollution to groundwaters.

Waste materials arising from "agricultural" holdings, which include used seep dip, are currently not classified as controlled wastes under the Environment Protection Act (1990). Wastes such as sheep dip are likely to become controlled wastes following a Government review.

3.2 Proposed Control Regime

In addition to legislative controls, there is significant opportunity for activities to be influenced by relevant Codes of Practice, especially codes linked to the Groundwater Regulations. The Agency wishes to make the most of its pollution prevention powers to reduce the risk of

pollution and will seek to maximise the use of Codes of Practice as outlined in section 2. However, where pollution does occur, the Agency will rigorously enforce the legislation in accordance with its published Enforcement and Prosecution Policy Statement.

3.3 General Principles for Implementation of Legislation

The principal pollution prevention controls will be exercised through the Groundwater Regulations 1998, and Works Notice provisions of the Water Resources Act 1991.

3.3.1 Soakaways

The Agency will **not authorise** disposal of sheep dip compounds to a **soakaway**. Such disposal may be in breach of the Groundwater Regulations and is not seen as a sustainable option for the disposal of used dip. In by-passing the surface vegetation and top soil, there will be an increased risk of polluting material reaching both groundwaters or surface waters. As all currently licensed sheep dip formulations contain List I substances the use of a soakaway is not appropriate.

Recommendation 9

The Agency will no longer accept the disposal of used sheep dip to soakaways.

3.3.2 Sheep Dipping Operation

If the sheep dipping operation does not involve any discharges or deliberate disposal of material to land or water it will not require an authorisation. The activity will be controlled by the use of **Notices** and a detailed **Statutory Code of Practice** made under the Groundwater Regulations 1998.

Recommendation 10

The dipping activity poses a high risk at many old and outdated sites, and will be a priority area for Agency pollution prevention campaigns.

3.3.3 Notices

A Notice may be served if disposal of sheep dip to land is being carried out without an authorisation required under the Groundwater Regulations. Similarly, if pollution of Controlled Waters has occurred, or the infrastructure or dipping management does not follow a relevant Code of Practice, Notice provisions may be used to bring about environmental protection.

3.4 Authorisations under Groundwater Regulations

The Agency may need to deal with over 40,000 sheep farms. All of those disposing of their dip to land will need to apply to the Agency for an authorisation. This poses considerable resource

implications for the Agency in properly administering and implementing the Groundwater Regulations. The approach which the Agency intends to adopt is:

- initially, applications will be prioritised for determination, and will take account of the Agency's **Groundwater Protection Policy**. Disposal to the most vulnerable, and known problem areas, will carry a higher priority;

- only applications for surface spreading to land will be accepted. Discharges to soakaway will not be accepted. Upon receipt, applications will be screened, and any for disposal to soakaway or for direct discharges to any watercourse will be immediately rejected and notified to the applicant, with an appropriate warning about its continued use. A follow up visit by field staff may then be arranged; and

- applicants will be expected to provide adequate details to enable an authorisation to be issued efficiently.

4 DISPOSAL OF USED DIP

4.1 Current Practices

At present each dipping or showering operation usually produces small quantities of used dip for disposal (typically ≈1m^3 (≈220 gallons) from a static dip and ≈0.3m^3 (≈ 75 gallons) from a shower or mobile dip). Even these small volumes of used dips, especially if they contain SP compounds, can cause serious damage to the environment unless they are disposed of carefully.

R&D Technical Report P170 identified that specialised facilities for the disposal of used dip such as chemical treatment, land filling or incineration are rarely available and that the costs of such facilities are generally prohibitively expensive. In addition there are risks, costs and practical difficulties associated with transporting used dip long distances, particularly if this is from remote areas with poor roads. It should also be noted that if agricultural wastes become classified as controlled wastes, the disposal of used dip off farm will render the transport and disposal of the used dip subject to the waste management legislation, including carrier registration and documentation and the associated costs. For these reasons the Agency accepts that, at present, widespread use of these waste disposal facilities is not feasible and disposal onto land, subject to prior authorisation, at the farm at which treatment has taken place is the most practicable option.

MAFF's Code of Good Agricultural Practice for the Protection of Water (1990) ("MAFF Water Code") suggested that disposal of used dip to soakaways may be acceptable. As indicated in the revised Code (1998) this is no longer the case and all key guidance now stipulates that disposal to soakaway is unacceptable.

4.2 Disposal Rates

MAFF's Water Code(1998), the "Scottish Code" and HSE/VMD/SEPA/EA leaflet AS29r- Sheep Dipping (1998), stipulate that used dip should not be disposed of at a rate of more than 5 m^{3}ha^{-1} (≈450 gallons per acre) . The MAFF Water Code and AS29r suggest that slurry or water can be added to dilute used dip threefold when disposing via a slurry tanker. This has arisen simply because many slurry tankers cannot operate effectively at application rates of <20 m^{3}ha^{-1} (≈1800 gallons per acre). It is, therefore, the limitations of spreading equipment rather than environmental considerations that have driven this suggestion.

Agency experience is that this suggestion has been misinterpreted as a **general requirement** to dilute used dip prior to disposal. The suggested dilution rates, however, still leave the used dip toxic to many life forms. Dilution only serves to increase the volumes of pollutant thereby increasing the risks, both to the terrestrial environment and the water environment because of the larger area required for disposal.

The Agency noted ADAS's comments that repeated applications of used dip to the same site may

enhance degradation rates.

Recommendation 11

Providing prior investigations confirm conditions are suitable, the Agency would prefer UNDILUTED dip rather than diluted dip to be disposed ONTO land. In some cases an area of 2500m^2 would suffice. This does not, however, preclude dilution to facilitate disposal via a slurry tanker where this can be safely undertaken.

Recommendation 12

The Agency recommends that appropriate equipment to spread used dip at low application rates onto land be developed.

4.3 Criteria for Acceptable Disposal

Given the risks to water users and other parts of the environment, the suitability of sites for disposal will need to consider :-

- nature of the ground, both the topsoil and underlying geology;
- protection of water quality, both surface and groundwaters;
- water uses; and
- likely impact on terrestrial ecology, including possible impact on Sites of Special Scientific Interest etc.

Recommendation 13

The Agency will assist DETR to produce appropriate guidance on acceptable disposal sites for implementation of the Groundwater Regulations 1998.

4.4 Additional Considerations for Mobile Contractors

Even though volumes of used dip are usually substantially less from mobile treatment systems than static dip baths, transport off farm is likely to render the activity liable to compliance with Waste Management Regulations and the associated cost requirements. Disposal on the farm where treatment takes place, subject to compliance with the Groundwater Regulations, is likely to be the best option. Whilst the farmer is always likely to have responsibility for safe disposal the mobile contractor may also have a responsibility. As already recommended, in Chapter 2, both parties should give full consideration of their respective of responsibilities.

5 REDUCING THE TOXICITY OF USED DIP

5.1 Toxicity Reduction Methods

Some manufacturers of sheep dip compounds have developed methods to reduce the toxicity of used dips. These methods involve the addition of strong alkalis such as sodium hydroxide, sodium hypochlorite and calcium hydroxide (slaked lime) to raise pH levels and speed up degradation rates. The Agency has been working closely with manufacturers to assess their data on the effectiveness of these methods and the environmental risks of the breakdown products.

To date two manufacturers have provided satisfactory data . These are the use of sodium hydroxide and a surfactant to treat Grampian Pharmaceutical's high cis cypermethrin and calcium hydroxide to treat Novartis' diazinon products. Both treatment methods significantly reduce toxicity to non- target organisms and the Agency will be encouraging the adoption of these treatment methods.

Before these are used the Agency will need to be satisfied that suitable contingency methods exist on site, to both minimise pollution risks from the additional chemical usage and the necessary storage of the admixture.. Requirements, such as the possible need for a secondary holding vessel and the necessity to use only accepted and specific treatment methods and chemicals will be included in the proposed Code of Practice.

Recommendation 14

Where the Agency is satisfied that suitable contingency arrangements for pollution control exist on site it will encourage the use of acceptable proprietary methods to reduce the toxicity of used sheep dip solution.

Recommendation 15

The Agency will encourage other manufacturers of sheep dip chemicals to develop acceptable toxicity reduction methods.

5.2 Addition to Solid Materials

Report P170 identified the potential for degradation of used dip in biobeds, or in farm yard manure, where naturally occurring breakdown processes may continue in isolation from the wider environment. There are many practical and research and development issues to be resolved before these may be used as practicable methods for disposal of spent sheep dips. The Agency is currently jointly funding work into the design and effectiveness of biobeds for dilute pesticide disposal and is seeking to extend this to include evaluation of their suitability for sheep dip disposal.

6 WASTE MINIMISATION AND FLOCK MANAGEMENT

6.1 Minimisation of the Use of Treatment Chemicals

Whilst the elimination of the need to dip or shower sheep as a contol against ectoparasites is a long term objective, the Agency recognises that on animal welfare grounds, farmers currently need a range of options to treat ectoparasitic infection of sheep effectively. Alternatives to dipping, showering or jetting are becoming increasingly available and should be encouraged where practicable, but the Agency accepts that farmers may still need to be able to dip sheep to control some ectoparasites.

Given the high toxicity to the wider environment of all treatment compounds, it is however, essential to minimise the quantities for use and disposal. ADAS, in Report P-170, suggested the development and promotion of positive flock management plans, to reduce the need for treatment and using alternatives to dip compounds eg "pour-ons" where practicable. In **principle,** this has been widely accepted but it has been pointed out that these can only go some of the way to reducing the need to dip sheep.

Recommendation 16

The Agency will work with key organisations such as MAFF, the NSA and Farming Unions to develop and promote appropriate flock/disease management techniques.

It is intended these will include:

- discouragement of the long-standing tradition of dipping of flocks irrespective of actual need to dip sheep;

- consideration of the possibility of systematic compulsory treatment within defined periods or areas. Although this will increase dipping or other treatments in the short term, it may help substantially reduce quantities in the longer term;

- recognition of the role of vehicles as havens and vectors for spread of ectoparasites to animals going to and from market and to slaughter - a contaminated vehicle can easily infect subsequent loads;

- security of boundary fences, including the inadequacies of single wire fences;

- encouragement of closed flock techniques and disease management plans to help reduce the spread of ectoparasites;

- the need for different techniques for differing types of sheep farmers:

    - hill farmers, often farming common land with few, if any boundaries;

- lowland farmers, who buy in considerable stock numbers, but generally farm using secure boundaries and fields; and
- marginal land farmers, who may buy stock from hill farmers, as well as sell to lowland farmers;

- techniques to help minimise infestation including from blow fly and action against bracken harboured scab mites, ticks etc; and

- the practicalities of promoting best practice and providing training to appropriate people, including Agency staff.

6.2 Reducing the Quantities of Used Solution

There is some scope for reducing the volumes of used dip for disposal, principally by:

- design and careful selection of new proprietary dipping baths, which often use lower volumes than older baths that were constructed on site; and

- developments in jetting and showering systems to reduce volumes of surplus material.

Recommendation 17

Farmers and their contractors are encouraged to reduce the volumes of dip for disposal by considering the design, constuction and use of their facilities.

6.3 Post Dipping Flock Management

Sheep entering watercourses or wetlands shortly after treatment has been identified as a cause of serious pollution, with notable cases reported in the Agency's North West and Midlands Regions. Guidance will be included in the proposed CoP to highlight the need for:

- provision of a secondary holding area to allow drying of the fleece;

- isolation of sheep from watercourses or wetlands within this area; and

- a planned route back to pasture, which eliminates the need to pass through water and minimises risks of drainage off roadways etc.

6.4 Dipping of Sheep Other Than for Animal Welfare

The Agency is aware that sheep are frequently dipped for cosmetic reasons, associated both with showing and, more often, with the sale of sheep. There is also some anecdotal evidence that farmers are encouraged to dip sheep just prior to taking them to market.

Recommendation 18

The Agency does not accept the need for dipping, showering or similar sheep treatment practices other than for strict animal health considerations and will be working with the industry to restrict such activities.

The Agency does, however recognise that this may have implications for disease control for market operators and hauliers and the need for clean sheep at market and will take these, often conflicting, needs into account.

Recommendation 19

The Agency will discuss with market operators, livestock hauliers and sewage treatment works operators ways in which discharges from livestock markets via the sewerage network may be reduced.

6.5 Moorland Management Schemes

There are a number of moorland regeneration schemes (funded by the European Union's Objective 5b programme) that have taken an integrated approach to improve sheep productivity, increase the rural economy and enhance the environment.

One example is the Moorland Regeneration Programme run by the North York Moors National Park which aims to reduce the high death rates amongst lambs caused largely by tick related diseases. This programme provides a sheep health scheme where there is an opportunity for the farmer to have his flock management practices reviewed by a veterinary surgeon over a 12 month period. Theprogramme also includes measures to control bracken which harbours ectoparasites, and grant aid to improve sheep dipping/handling facilities.

Recommendation 20

The Agency will support where possible, partnership schemes that take an integrated approach to protecting and enhancing the environment and the rural economy.

7 AUTHORISATION & SUPPLY OF SHEEP DIP COMPOUNDS

7.1 Marketing Authorisations for Sheep Dip Compounds

In legislative terms sheep dips are veterinary medicines and their authorisation is covered by the Marketing Authorisations for Veterinary Medicinal Products Regulations (1994). The Veterinary Medicines Directorate (VMD) assess for quality, efficacy and safety of products put forward for authorisation. Safety includes safety to the environment and, in recent years, the Agency has provided advice on potential risks to the environment to VMD via the DETR. VMD produces a product assessment report that is considered by the independent Veterinary Products Committee (VPC). The VPC make recommendations to Government Ministers on whether or not individual products should be granted marketing authorisations.

Recommendation 21

Currently the membership of the VPC includes one environmental expert. Given heightened concerns over the environmental impact of some veterinary products, particularly sheep dip, the Agency would like an additional environment specialist included in the VPC membership.

7.2 Product Labelling and Manufacturers Literature.

The Agency is concerned that all users of sheep dip products are provided with clear and sufficient information on their safe use and disposal. Providing adequate information in a clearly understood form on the product label alone is difficult because of lack of space. Considerable scope does, however, exist to display prominent, clear messages on promotional literature and packaging.

Recommendation 22

The Agency will work closely with relevant organisations, manufacturers and suppliers to improve the clarity of guidance to users of sheep dip. Discussions will include consideration of the way in which some SP compounds are being marketed, to ensure their potential threat to the environment is clearly displayed.

7.3 Product Stewardship

Several respondents to the consultation exercise suggested that manufacturers should take greater responsibility, especially to safely collect and dispose of used dip. ADAS specifically considered the environmental risks and overall costs of such a collection system and concluded that this would not be sustainable.

Recommendation 23

The Agency believes that the manufacturers and possibly the suppliers could take a more active role in minimising the pollution risks, for example in helping to train users. Discussions have started with one manufacturer and it is intended to follow this up with others.

8 TEXTILES

Many of the reported environmental quality standard (EQS) failures attributed to sheep dip compounds relate to dip residues being discharged via sewage treatment works after processing of fleeces and skins by the textile industry. Processes include wool scouring to remove impurities such as wool grease, dirt and sweat, further wool processing at dyehouses and the processing of skins by fellmongers. Many of these residues arise from imported wool or skins.

A National Sheep Dip and Textiles Working Group is considering the problem. The group is chaired by the Environment Agency and includes representatives from SEPA, VMD, NOAH, Water Companies, the textile industry and the NSA. The group has considered ways of reducing residues in skins and fleece, methods of reducing emissions from textile plants and the setting of both EQSs and standards in discharge consents. The group is developing a separate strategy document, that provides detailed discussion of the issues and makes recommendations for tackling the issues. This will be published during 1999 and as the final recommendations have not yet been agreed the Agency will contribute to their implementation and further development.

Recommendation 24

The Agency will contribute to the implementation of recommendations made by the National Sheep Dip and Textiles Working Group.

9 MONITORING

The Agency is currently reviewing its monitoring programmes including the monitoring of pesticides in water. A significant proportion of the Agency's monitoring effort is spent on pesticides listed in various EC Directives. Many of these are old, persistent pesticides that are no longer approved for use. The amount of effort and cost of analysis may be better spent on wider monitoring of currently used chemicals such as those used in sheep dipping and possibly cover other environmental media such as soils, sediments and fauna. The review is also needed to address the wider presence of sheep dip compounds confirmed from limited monitoring and to comply with requirements of the Groundwater Regulations. Key recommendations are therefore that:

Recommendation 25

The Agency should target its monitoring at chemicals currently licensed for use and evaluate the need to monitor other media such as soils, sediments and fauna; and

Recommendation 26

The Agency should extend its currently limited monitoring network for sheep dip compounds to provide more comprehensive coverage of the environment.

10 COMMON AGRICULTURAL POLICY (CAP)

Currently the sheep industry is subsidised by the European Commission under the CAP and this is achieved by paying a farmers for the number of sheep (headage payments) they have in their flocks. This combined with a decline in the number of shepherds and a reduction in active flock management, particularly in the uplands, has contributed to environmental damage as well as an increased need to treat sheep for ectoparasite infestations. The Agency would like to see a move away from headage payments to sheep farmers to a support system based on environmental criteria that are sustainable both environmentally and for the industry.

Recommendation 27

That the reform of the CAP involves a move away from headage payments to sheep farmers to an area based system.

The European Commission's Agenda 2000 draft Regulations were recently published and these include a proposal for a new rural development Regulation. This would combine agri-environment, forestry, structural adjustment, training and rural development aids. If these draft proposals go ahead there will be further opportunities to fund projects similar to those currently funded by the Objective 5b programme (see 6.5) which will include flock and moorland management. These are likely to be targeted to priority areas i.e. Less Favoured Areas.

There is some concern by the various countryside agencies that the proposed funding for the new Rural Development Regulation is too low. The Environment Agency should be involved as a partner in the development and promotion of rural development projects. Involvement should include implementation of environmental legislation, and also prevention measures such as flock and land management. An integrated approach to upland management will have wide benefits, in addition to minimising pollution from sheep dipping, including soil and bank erosion control, bracken control, reducing eutrophication of lakes, improving water quality intended for public supply (eg. colour in runoff from overgrazed peat soils), and improving recreation & fisheries.

Recommendation 28

The Agency will support the Government and other countryside agencies to influence the CAP reform process to ensure adequate funding of rural and environmental measures.

11 R&D

11.1 Wider Environmental Impacts of Sheep Dipping and Disposal

Specific research and development needs have been identified in chapters 5 and 8. A comprehensive environmental strategy for sheep dipping, however, needs to consider potential impacts on environmental compartments other than rivers, streams and groundwaters.

Despite the absence of direct evidence, there is a high risk that terrestrial organisms may be affected by repeated disposal of sheep dip. OP and SP compounds are highly toxic to invertebrates and could impact on soil ecology before biodegradation is complete. Soil bound contaminants may also be transported into stream sediments by erosion. Research into these issues could also incorporate field studies on the rate of biodegradation of dip compounds.

Research has indicated that the sheep dips diazinon and cypermethrin can both have sub-lethal effects on migratory salmon, affecting the olfactory response. If this occurs during the main salmon run then significant impacts on salmon breeding success are possible.

Sheep treatment chemicals could also have impacts on aquatic invertebrate diversity and ecological balance, as well as indirect effects through the food chain. The occurence of such effects may be difficult to investigate.

Recommendation 29

Further research is needed into reducing the toxicity of used dipping compounds and residues from the textile industry as well as into the wider pollution risks including the potential impact on terrestrial organisms, stream sediments and sub-lethal effects such as olfactory impairment in migrating salmonids.

12 SUMMARY OF PROPOSED ACTIONS AND RECOMMENDATIONS

This section summarises how the issues highlighted in this report and in R&D Technical Report P-170 can be dealt with. Sheep treatment chemicals are extremely toxic to invertebrate fauna and the Agency believes that if the key recommendations that are brought together in this chapter are implemented there will be significant reductions in both the risks to and damage to the environment that result from poor storage, use and disposal of sheep treatment chemicals. This will only be achieved, however, in partnership and with the support of sheep farmers and interested organisations as well as Government departments and agencies. Many of the recommendations are straightforward, are already agreed and can be achieved within the remit of the Agency. Others, however, require refinement with individuals and organisations in order to set common goals and achieve better understanding of the responsibilities. The Agency has outlined the issues relating to the environment and it is hoped that those associated with the sheep farming industry will take ownership of these so that the environment can be better protected, whilst allowing the industry to remain viable. The Agency will therefore continue and encourage further dialogue, particularly with those identified below to develop and achieve these goals.

Issue		Lead	Others	Timeframe
Chapter 2	**EDUCATION AND GUIDANCE**			
1	It is proposed that a comprehensive Code of Practice for the protection of the environment from the control of ectoparasites in sheep be produced, which includes, in full, any relevant Statutory Code of Practice for the Groundwater Regulations	Environment Agency	DETR MAFF HSE EN CCW	Statutory elements for Groundwater Regulations to be considered before 1/4/99 and wider code to be developed during 1999
2	TheAgency will initiate discussions with mobile contractors and their representatives to evaluate the benefits of an accreditation scheme	Environment Agency	NAAC/NSA	Initial discussions to start in 1999 with aim of scheme inception, if appropriate, in 2000-2001
3	It is essential that all users of mobile dipping equipment are given clear guidance on its safe use by the suppliers and manufacturers.	Suppliers Manufacturers	Environment Agency	Immediate and ongoing

Issue		Lead	Others	Timeframe
4	It is recommended that where farmers employ mobile contractors both parties fully consider their respective environmental responsibilities.	NAAC Farming Community	Environment Agency	From 1 April 1999
5	The Agency will work closely with key agricultural industry groups to ensure they are familiar with the Agency's aims and the need to protect the environment so they can provide complementary guidance, consistent with the proposed Code of Practice.	Environment Agency	MAFF HSE Advisory Services Suppliers NSA	Programme to be developed over next two years
6	Whenever treatment is undertaken using externally applied insecticides, at least one person at the treatment site should have a full CoC, or is able to demonstrate a similar level of competence, and remains on site throughout the treatment process.	VMD NPTC	Environment Agency	Immediate and ongoing
7	The Agency intends to run a substantial sheep dip campaign in 1999, again working closely with key groups to promote this strategy and an understanding of the Groundwater regulations.	Environment Agency	Farming Unions NSA NAAC	Prior to principle dipping periods throughout year and ongoing after
Chapter 3 THE LEGISLATIVE FRAMEWORK				
8	The Agency will enforce the Groundwater Regulations in line with its enforcement and prosecution policy in order to prevent and minimise the risks of pollution to groundwaters.	Environment Agency		Immediate priority
9	The Agency will no longer accept the disposal of used sheep dip to soakaways.	Environment Agency		Immediate

Issue		Lead	Others	Timeframe
10	The dipping activity poses a high risk at many old and outdated sites, and will be a priority area for Agency pollution prevention campaigns.	Environment Agency		Immediate priority
Chapter 4 DISPOSAL OF USED DIP				
11	Providing prior investigations confirm conditions are suitable, the Agency would prefer UNDILUTED dip to be disposed ONTO land rather than diluted dip. In many cases an area of 2500m^2 would suffice. This does not, however, preclude dilution to facilitate disposal via a slurry tanker where this can be undertaken safely.	Environment Agency	DETR MAFF HSE EN CCW	From 01/04/1999
12	The Agency recommends that appropriate equipment to spread used dip at low application rates onto land be developed	Commercial	Environment Agency NAAC	Early development recommended
13	The Agency will assist DETR to produce appropriate guidance on acceptable disposal sites for implementation of the the Groundwater Regulations 1998.	DETR Environment Agency		To be determined by DETR
Chapter 5 REDUCING THE TOXICITY OF USED DIP				
14	Where the Agency is satisfied that suitable contingency arrangements for pollution control exist on site it will encourage the use of acceptable proprietary methods to reduce the toxicity of used sheep dip solution.	Commercial Manufacturers	Environment Agency	As data become available and farmers can demonstrate site suitability and presence of contingency methods
15	The Agency will encourage other manufacturers of sheep dip chemicals to develop acceptable toxicity reduction methods.	Commercial Manufacturers	Environment Agency	Immediate and ongoing

Issue		Lead	Others	Timeframe
Chapter 6	**WASTE MINIMISATION / FLOCK MANAGEMENT**			
16	The Agency will work with key organisations such as MAFF, the NSA and Farming Unions to develop and promote appropriate flock/disease management techniques.	Environment Agency	NSA NFU/FUW	Immediate and ongoing development
17	Farmers and their contractors are encouraged to reduce the volumes of dip for disposal by considering the design and construction and use of their facilities.	Farmers Manufactures	Environment Agency	Immediate and ongoing
18	The Agency does not accept the need for dipping, showering or similar sheep treatment practices, other than for strict animal health considerations and will be working with the industry to restrict such activities	Environment Agency	NSA Market Operators WSPIcs NOAH	Immediate
19	The Agency will discuss with market operators, livestock hauliers and sewage treatment works operators ways in which discharges via the sewerage network may be reduced.	Environment Agency	Market Owners WSPIcs Hauliers	Immediate and ongoing.
20	The Agency will support, where possible, partnership schemes that take an integrated approach to protecting and enhancing the environment and the rural economy.	Environment Agency	Various	As opportunities arise

Issue		Lead	Others	Timeframe
Chapter 7	**AUTHORISATION & SUPPLY OF SHEEP DIP COMPOUNDS**			
21	Currently the membership of the VPC includes one environmental expert. Given the heightened concerns over the environmental impact of some veterinary products, particularly sheep dip, the Agency would like an additional environment specialist included in the VPC membership	Environment Agency VPC		As soon as practicable
22	The Agency will work closely with relevant organisations, manufacturers and suppliers to improve the clarity of guidance to users of sheep dip. Discussions will include consideration of the way in which some SP compounds are being marketed, to ensure their greater threat to the environment is clearly displayed.	Environment Agency	NSA, Manufacturers VMD	Ongoing
23	The Agency believes that the manufacturers and possibly the suppliers could take a more active role in minimising the pollution risks, for example in helping train users. Discussions have started with one manufacturer and it is intended to follow this up with others.	Environment Agency	Manufacturers Suppliers NFU Farming Press	Ongoing during 1999 and afterwards
Chapter 8	**TEXTILES**			
24	The Agency will contribute to the implementation of recommendations made by the National Sheep Dip and Textiles Working Group	National Sheep Dip and Textile Group		Ongoing and according to Group timetable

Issue		Lead	Others	Timeframe
Chapter 9 MONITORING				
25	The Agency should target its monitoring at chemicals currently licensed for use and evaluate the need to monitor other media such as soils, sediments and fauna.	Environment Agency		Recommendation to be fed into Agency's ongoing review of monitoring
26	The Agency should extend its currently limited monitoring network for sheep dip compounds to provide more comprehensive coverage of the environment.	Environment Agency		Recommendation to be fed into Agency's ongoing review of monitoring
Chapter 10 COMMON AGRICULTURAL POLICY (CAP)				
27	That the reform of the CAP involves a move away from headage payments to sheep farmers, to an area based system.	Environment Agency	MAFF	Ongoing
28	The Agency will support the Government and other countryside agencies to influence the CAP reform process to ensure adequate funding of rural and environmental measures.	Environment Agency	MAFF, English Nature CCW	Ongoing.
Chapter 11 R&D				
29	Further research is needed into reducing the toxicity of used dipping compounds and residues from the textile industry as well as into the wider pollution risks including the potential impact on terrestrial organisms, stream sediments and sub-lethal effects such as olfactory impairment in migrating salmonids.	Research institutions Manufacturers	Environment Agency English Nature CCW	Long term research needed; results expected over longer term

13 BIBLIOGRAPHY/SOURCES OF INFORMATION

ADAS, (1998), A Strategic Review of Sheep Dipping. Environment Agency R&D Technical Report P170.

Blackmore J and Clark L (1994). The Disposal of Sheep Dip Waste - Effects on Water Quality. NRA R&D report 11.

Environment Agency, National Sheep Association, National Association for Agricultural Contractors, (1997). Mobile Sheep Dipping; A guide to reducing the pollution risks.

Environment Agency (1998) Welsh Sheep Dip Monitoring Programme 1997.

HSE, VMD, EA & SEPA (1998). Sheep Dipping. Leaflet. AS29(rev2)

MAFF (1991). The Code of Good Agricultural Practice for the Protection of Water. MAFF, Welsh Office, 1991.

MAFF (1998). The Water Code; Code of Good Agricultural Practice, MAFF, Welsh Office, 1998. (PB 0587)

R C Morris (1997) Sheep dipping practices- A study within one river catchment in South Ayrshire

The Groundwater Regulations 1998, Statutory Instrument No. 2746, 1998 HMSO.

Virtue, W A & Clayton J W (1997)Sheep dip chemicals and water pollution .

APPENDIX A

Organisations and Individuals involved in consultation as part of production of R&D Technical Report P170.

1 Organisations sent copy of the report on 27th July, with an invitation to comment

Department of the Environment, Transport and the Regions
Ministry of Agriculture, Fisheries and Food
Welsh Office
Veterinary Medicines Directorate
National Sheep Association
National Farmers Union
Scottish Environment Protection Agency
Water UK Ltd.
National Office of Animal Health
Health and Safety Executive
Farmers Union of Wales
Country Landowners Association
National Association of Agricultural Contractors
Soil Association
Veterinary Investigation Centre
English Nature
Countryside Council for Wales
British Geological Survey
Department of Agriculture Northern Ireland
Anglers Conservation association
Farming and Rural Conservation Association
Royal Society for the Protection of Birds

2 Organisations or individuals sent a copy of the report in response to a request or discussion.

Bimeda Ltd
Novartis
Grampian Pharmaceuticals
Friends of the Earth
Word wildlife Fund
Green peace
Wildlife Trusts
Sheep Consultancy, Kettering
Clean Technology Group Cardiff University

CEFAS Burnham – on Crouch
Department of the Environment Northern Ireland
Salmon and Trout Association
Wild Trout association
Official Group on OPs
Animal Health Distributors association (UK) Ltd.
J Brander
Exeter University

3 Individuals or Organisations sent copies of the report following a request to WRc

Devon Wildlife trust
Friends of the Earth Cymru
B L C Leather Technology Centre
Trowers & Hamlins
Global Environmental
North West Water
Environmental Protection Agency Northern Ireland
Scottish Agricultural College
Dawson UK Ltd
Department of the Environment Northern Ireland
H E Shaw
D Wickens
Entec UK Ltd.
J Chaney
D G Environmental Ltd
East of Scotland Water
National association of Agricultural Contractors

APPENDIX B

Glossary

CAP	Common Agricultural Policy
CoC	Certificate of Competence
COP	Code of Practice
DETR	Department of the Environment Transport and Regions
EC	European Commission
EQS	Environmental Quality Standard
FUW	Farmers' Union of Wales
HSE	Health and Safety Executive
MAFF	Ministry of Agriculture, Fisheries and Food
NAAC	National Association of Agricultural Contractors
NOAH	National Office of Animal Health
NFU	National Farmers' Union
NPTC	National Proficiency Tests Council
NSA	National Sheep Association
OP	Organophosphate
SEPA	Scottish Environmental Protection Agency
SP	Synthetic pyrethroid
VPC	Veterinary Products Committee
WO	Welsh Office