Chemical and Hazardous Waste

1.1 This paper summarises the chemical and hazardous waste opportunities in Hampshire required to meet the Vision of the MRS. This waste stream overlaps with waste streams covered by other papers on **WEEE** (household items), **ELVs** (battery acid, used vehicle oil), **construction and demolition wastes** (asbestos and other hazardous substances, contaminated soils), and **agricultural wastes** (used sheep dip, pesticides).

1.2 **The main opportunities to meet the MRS vision**

1.3 **Locally**

- The MRS partners and industry need to work more closely together to produce timely and accurate local data on hazardous waste in order to better inform decision-makers and improve its overall management. Information needs to be collected on producers and disposers, and quantities of materials produced. The industry can provide useful data regarding treatments and capacities available.
- The Environment Agency should use hazardous waste producer compliance checks under the expected new hazardous waste regulations to increase awareness of and access to best practice.
- The MRS partners, and in particular the Environment Agency, should support and assist Envirowise in helping producers and industry to use less hazardous material in their products. Efforts should be focussed on the large producers first, to make the greatest gains with the least resources.
- The MRS partners need to ensure that hazardous waste legislation is enforced as efficiently and effectively as possible. More effective joint working needs to be undertaken between the Environment Agency, local authorities and law enforcement agencies in order to improve detection and prosecution and the safe removal of illegal hazardous waste dumping.

1.4 **Regionally**

- The MRS partners should keep a close working relationship with SEERA and SEEDA in order to maximise the opportunities for sharing infrastructure required for disposal and processing hazardous waste across the south-east region.
- The MRS partners should support initiatives for the more detailed regional data gathering.

1.5 **Nationally**

- The MRS partners should lobby the Government and provide clear leadership, in conjunction with Local Planning Authorities, Regional Planning Authorities and the Environment Agency to help deliver a

nationally coherent set of hazardous waste strategies and a timetable for action, taking account of local and strategic needs.

- The MRS partners should lobby the government to raise landfill tax and close the economic gap between landfill disposal and other technologies.
- The MRS partners should support efforts by the Environment Agency in developing, consulting upon and implementing criteria for the acceptance of stable non-reactive hazardous wastes in dedicated cells on non-hazardous wastes landfill sites as quickly as possible.
- The MRS partners should encourage hazardous waste producers to share best practice in waste prevention, minimisation, treatment and disposal with their trade associations. This could be done through waste minimisation clubs, distribution of sector guidance by the Environment Agency and publicising cost benefits and best practice examples.
- The MRS partners should lobby the government to let the Environment Agency spend a proportion of their licensing income on enforcement. A Permitting Review is being carried out in May 2004 which would be a good opportunity to do this.

1.6 **European:**

- The MRS partners should monitor and support the European Union in their efforts to help industry find ways of using less hazardous substances in manufacturing through collaboration in EU-wide life-cycle assessment programmes, especially for SMEs.

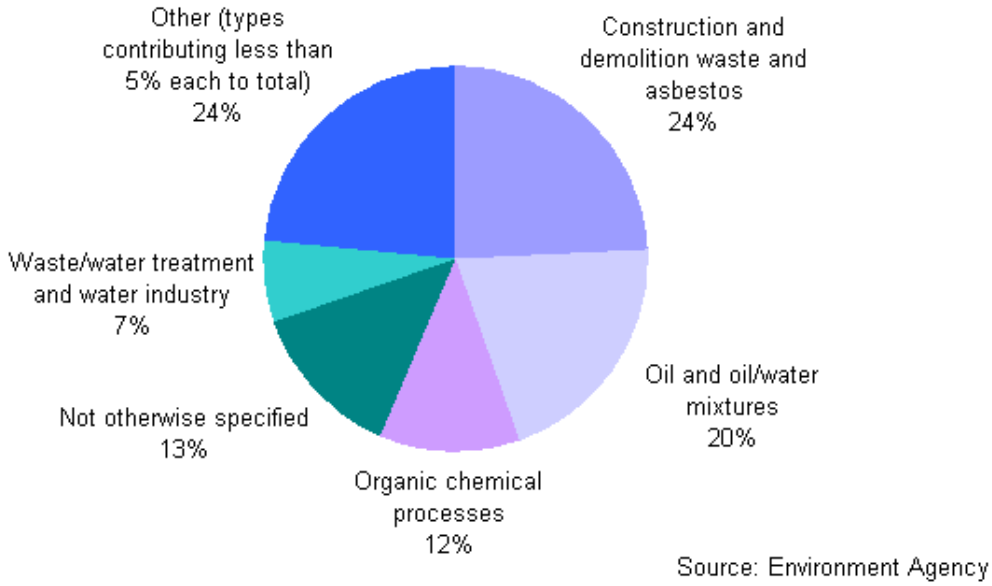
Current chemical and hazardous waste resources in Hampshire

2.0 Commercially generated waste can arise from a wide variety of industries including agriculture, manufacturing, healthcare and the water industry. Hazardous waste covers a very large number of waste types and has a huge range of management methods. The main hazardous waste producing industries nationally are chemical and pharmaceutical, construction and demolition, engineering, waste treatment and petrochemical industries. Wastes classified as hazardous include waste oils, contaminated construction and demolition waste, contaminated soils, air pollution control residues, filter cakes, wastes from the non-ferrous metals industry, clinical waste, leachate from landfill sites, solvents, heavy metals, CFCs PCBs, PCTs, paints, adhesives, acids, and photographic chemicals. Organic sludges and oily wastes include wastes such as separator sludges from petrol stations. Waste mineral and fuel oil consists of the residual products originating from vehicles, ships, industrial machines and so on. Hazardous construction and demolition waste include asbestos, contaminated soil, tar products, treated timber and varnish. Household waste contains small amounts of hazardous waste which is generally disposed of with other residual domestic waste, although some

provision is made for collection at nine Household Waste Recycling Centres (HWRCs).

2.1 The largest sources of hazardous wastes nationally are the construction and demolition wastes and waste oils, which together account for nearly half of hazardous wastes as shown in Figure 1.

Figure 1: Hazardous waste produced in England and Wales, 2002



Source: Environment Agency

2.2 Figures for the production of hazardous waste and chemicals are available on a regional basis, but specific data for Hampshire is more difficult to obtain, and in some cases has to be estimated based on regional data. Recent and reliable baseline data will not become available until Hazardous Waste Regulations are implemented in 2005, and new data is collected.

2.3 Hampshire produces about a third of the hazardous waste in the south-east region (excluding Greater London) (Environment Agency, 2000). During 2001, around 100,000 tpa of hazardous waste was generated in Hampshire of which the vast majority was waste oil (including oil and water mixes) and hazardous construction and demolition waste, with a smaller quantity of waste from organic chemical processes. The remaining quantities of hazardous waste generated are relatively insignificant (Entec, 2003).

2.4 The main producers of hazardous waste in Hampshire who produced over 2500 tonnes per annum are Esso Petroleum (Fawley), Exxon Chemical (Hythe), Great Marsh (Totton), KD Offshore (Marchwood), Laporte Performance Chemicals (Southampton), Nalcon Exxon Chemical (Southampton), HM Naval Base (Portsmouth) and Pirelli (Eastleigh). The next biggest producer in Hampshire generates around 870 tonnes per year. Contaminated soils are a significant source of hazardous waste in Hampshire,

but are generally not “produced” consistently by one company and therefore do not feature on this list. It should be noted that at the time of writing, Great Marsh is expected to close and KD Offshore treats hazardous waste. Therefore whilst KD Offshore does generate hazardous waste requiring further management or disposal, this does not arise from the facility, but from other producers.

2.5 A consignment note system produces data on the type, quantity and origin of special wastes to be recovered or disposed of. A register of special waste moved from a site must be kept for three years. The system is monitored by the Environment Agency, who feed data into a special waste database, which is known as the Special Waste Tracking System (SWAT). This database holds information on every consignment of special waste in England and Wales, that is sent for disposal or recovery. Using this data, which has been obtained via the Agency’s Hazardous Waste Interrogator, information on the types and quantities of special waste generated and disposed of within the study area has been obtained (see Table 1). However, this system is due to change soon.

Table 1- Special Waste arisings in Hampshire, Portsmouth and Southampton (2001)

Type of Waste/Origin	**arisings (tonnes per annum)**
Oil, and Oil and Water Mixes	39 489
C&D Waste and Asbestos	37 402
Organic Chemical Processes	11 314
Air Pollution Control Residues	3,600*
Petrol, Gas and Coal Refining/Treatment	1 871
MFSU Paints, Varnishes, Adhesives and Inks	1 718
Solvents	1 654
Healthcare	675
Inorganic Chemical Processes	436
Waste/Water Treatment and Water Industry	279
Shaping/Treatment of Metals and Plastics	234
Agricultural and Food Production	193
Mining and Minerals	169
Packaging, Cloths, Filter Materials	121
Metal Treatment and Coating Processes	120
Thermal Process Waste (Inorganic)	97
Photographic Industry	54
Wood and Paper Production	15
Municipal and Similar Commercial Wastes	14
Leather and Textile Production	0.2
Not Otherwise Specified	4 407
Unclassified	29
TOTAL	**103 891.2**

Source: Environment Agency, 2003 (Hazardous Waste Interrogator).
*2003 figure, source: Onyx Hampshire,2004
Note: Excludes residues from non-public sector incineration and EfW facilities.

2.6 The figures in Table 1 do not include Air Pollution Control (APC) residues produced by the two clinical waste incinerators (Portsmouth and Gosport) or the two Shanks Group incinerators at Fawley. The HTI produces 20% of the waste volumes as bottom ash and sludge, which is hazardous and is currently landfilled. If running at maximum capacity this equates to 7,000 tonnes of material a year. Actual arisings need further research to determine.

2.7 More information is required on the sources of hazardous waste, and this needs to be investigated as part of the ongoing review of the overall strategy.

2.8 **Current Legislation**

- Waste Management Licensing and PPC (Environment Agency),
- EU Landfill Directive,
- Hazardous Waste Directive (91/689/EEC)
- Special Waste Regulations 1996
- Pollution, Prevention and Control Regulations 2000
- European Waste Catalogue 2002

Existing recovery routes and infrastructure in Hampshire

3.0 Current Resource Management

3.1 About half of the hazardous waste generated is exported outside the County, with approximately half of the remainder subject to chemical, physical or biological treatment. Most of the residual hazardous waste was either landfilled or recycled with a small amount burnt to provide energy (Entec, 2003). Historical rates of growth in hazardous waste are estimated at about 8% a year (Environment Agency, 2003). However, it is likely that this increase has more to do with new types of waste being classified as hazardous, than actual growth in the quantity of hazardous waste produced (for example oily wastes have only be classified as hazardous since 1996). The UK generally is moving towards an increasingly service based economy, with the manufacturing base moving abroad to places such as the far east**.**

3.2 Special waste was managed in a variety of different ways during 2000/01. As Table 2 illustrates, half was subject to chemical/physical/biological treatment. Of the remainder, the vast majority was landfilled or recycled.

Table 2 - Special Waste Disposal Routes in Hampshire 2000/01

	2000/01 (tonnes)	**2000/01 (%)**
Other Chemical/Physical/Biological Treatment	27 000	50

Landfill	13 000	24
Recycled (including metal recycling)	10 000	19
EfW*	4 000	7
Composted	0	0
TOTAL	**54 000**	**100**

Source: SWMA Update 2001, Environment Agency, 2002; and Minerals and Waste Planning in Hampshire Annual Report (2001).
Note: Does not include non-public sector incineration and EfW facilities

3.3 In 2000/01 54,000 tonnes of special waste was therefore handled in Hampshire, Portsmouth and Southampton. Details of every site licensed for keeping or treating special waste is contained on the Environment Agency's Regis database.

3.4 Hampshire has significant high temperature hazardous waste incineration capacity at Shanks Group, Fawley (35,000 tpa) although it is not possible to recover energy from the process, because of the temperatures involved and the need for rapid cooling to minimise the levels of dioxins produced. The incinerator is extremely versatile and can take a wide range of solid and liquid wastes. A further merchant Energy from Waste (EfW) incinerator on the same site has a capacity to incinerate 60,000 tpa of hazardous waste, although it is less flexible in the range of wastes it is able to process. The facility currently processes meat and bone meal (MBM), however, the facility is permitted to take other wastes in the future. These plants, as well as the two clinical waste incinerators and the Project Integra EfW plant, produce residues (bottom ash, APC residues or a mixture of both) these have historically been disposed of to landfill. Bottom ash and mixed ash have been disposed of locally, and APC residues out of County. Further information will be required to determine the quantities and disposal routes for sludges.

3.5 Cleansing Services Group has a treatment and transfer facility at Botley which can process some hazardous wastes. This is able to treat around 25,000 tpa of oil and water wastes. It also provides storage and bulking facilities for plating, chemical, pharmacy and cosmetics wastes (around 12-15,000tpa which is treated in Manchester), solvents (25-30,000 tpa which is recovered in Sussex), and cyanide, acids and alkali's (10,000 tpa which is either landfilled at Manchester or incinerated at Shanks HTI in Fawley.

3.6 Waste cooking oil can be reprocessed at A & B Oils in Southampton which currently processes about 6,250 tonnes a year**.** This includes used cooking fat, out of date cooking fat, chicken fat and kebab fat. Waste cooking oil is not a hazardous waste and is not included in the Special Waste figures. However these wastes fit best within this paper, and have therefore been considered. The maximum capacity of this facility is unknown.

3.7 There are two incinerators used for the disposal of clinical waste in Hampshire. Each can process up to one tonne of waste per hour, assuming a 90% availability this provides for a current clinical waste capacity of 15,768

tpa). These incinerators are situated at Haslar (Gosport) and at the Queen Alexandra Hospital (Portsmouth). However, it is expected that the Portsmouth facility will close in early 2005. These facilities produce an ash residue which requires disposal.

3.8 Onyx UK Ltd operate a waste treatment facility at Marchwood known as KD Offshore. It accepts a range of wastes, including oil and water mixes (~25% from ships) and mineral oil mixes, cutting oils, lubricants, other waste oils and interceptor wastes, leachates, solid port wastes and small quantities of hydrocarbon based chemical and acid/alkali wastes. A significant percentage of the waste processed is generated by Southampton port. Table 3 shows the current quantities of wastes received and disposed of, together with an estimated figure for the capacity of the plant.

Table 3 Current throughput and estimated maximum capacity for KD Offshore waste processing facility

Wastes Quantities Received:

Waste Type	**Typical Annual Tonnage Handled (Te)**	**Maximum Annual Tonnage (Te)**
Oil and water mixes	32 400+	52 000
Leachates and other wet wastes	32 010+	143 000
Solid/port wastes	710	1 560

Wastes and Product Disposed of:

Waste Type	**Typical Annual Tonnage (Te)**
Wet recovered oil	6500+
Aqueous effluent (to sewer)	55 193+
Oily sludge	1 700-
Gritty solids	44+

Source: Onyx Wetwaste,2004

Note: These figures were based on the data for 2003. Theoretical maximums have been estimated from the maximum discharge allowed by the consent to discharge (3500M^3/Week), and assume all plant apparatus working to full capacity.

3.9 The majority of the business is the treatment of liquid wastes, these are treated by a combination of phase separation, heating, de-emulsification and biological treatment. It is expected that the figures marked + in Table 3 will increase for 2004, and those marked - will decrease (Onyx Wetwaste,2004). This produces a wet recovered oil that is sold for blending into fuel and three waste streams of aqueous effluent (disposed to sewer), an oily sludge (that goes off to further treatment and is ultimately landfilled out of county as filter cake) and a gritty solid from tanker dig-out (that is typically landfilled locally). Onyx also operate ‘decanting tankers’ for emptying interceptors, these retain the sediment and oil whilst decanting the internatent fluid back into the

interceptor, saving on the amount of liquid requiring treatment. Biffa and Cleansing Services group also operate similar equipment.

3.10 Hampshire has 26 Household Waste Recycling Centres, of which nine are currently licensed to accept hazardous household waste from the public. The scheme has operated for a year, during which time a total of five tonnes of hazardous waste was collected. This is currently treated using pyroloysis at a facility in Avonmouth. The scheme was expanded in April 2004 to include separate collection of batteries, fluorescent tubes and long life light bulbs. The batteries are taken to Alton, were they are sorted before onward transportation to France for processing. Flourescent tubes and light bulbs are collected and taken to Manchester for recycling. Household hazardous waste makes up less than 1% of the total amount of household waste.

3.11 The majority of hazardous waste types can be treated thermally, chemically and biologically although some hazardous waste types may require solidification or may not benefit from treatment as a means of reducing their polluting potential.

3.12 **Current Social Issues**

3.13 Social issues are less relevant in the management of hazardous waste, than for some of the other waste streams because it is primarily a business problem, and will be driven by economics. However, planning applications for facilities to process or store hazardous waste are often controversial and result in significant local opposition. Even if the applications are successful, opposition can often result in delays and expense, particularly if an application is refused and is determined through a Public Inquiry. It is particularly important the planning officers and planning committee members understand the difficulties of hazardous waste management at a local level, and are able to deliver planning permissions for appropriate sites. This will involve extensive consultation with the community to ensure planning authorities have a broad consensus of the people they serve in the way hazardous waste is managed.

3.14 **Current Environmental Issues**

3.15 All wastes are potentially harmful but are defined as hazardous if, for example, they are highly flammable, toxic or carcinogenic. This includes wastes from, industrial chemical processes, oil refining, metals processes, solvents, waste oils, some clinical waste and asbestos. Any waste could be harmful if it is managed badly or disposed of illegally. Strict laws control how hazardous waste is managed because of the extra risks it poses to human health and the environment. These risks are very small when hazardous waste is managed properly. Reprocessing and the treatment of hazardous waste can render it either less hazardous or separate hazardous and non-hazardous components, reducing the volume of hazardous waste requiring end disposal.

3.15 Hazardous wastes can present a variety of environment issues, for example explosive, harmful to health, oxidising, poisonous and so on. The specific hazards posed are very different depending on the specific waste types, so it is not possible to be too detailed in this document. Hazardous waste facilities are often the subject of considerable public concern. This image has not be improved by some recent incidents involving poorly managed hazardous waste sites, and the subsequent impacts of these on their neighbours. It is therefore vital to ensure that the sites are properly regulated and managed, and the locations for the sites have regard to the potential effects on the environment and neighbouring communities.

3.16 Ilegal disposal (fly-tipping) of hazardous materials doubled between 2001 and 2002. In 2002, a quarter of all pollution incidents in England and Wales, and nearly half of the most serious, involved hazardous materials. There are indications that incidences are becoming more organised, as criminals beginning to make financial gains (stakeholder working group,2004).

3.17 Current Economic Issues

3.18 Table 4 shows the relative costs of different disposal options for hazardous waste. Landfill is significantly the cheapest disposal option at the moment, and so is more competative than recovery processes for many types of hazardous waste. The UK government has not attempted to regulate waste disposal to the extent it happens in Europe because of a desire not to increase the waste processing and disposal costs incurred by British industry. Landfill tax in Holland is much higher than in the UK.

3.20 Hazardous waste can be transported over very long distances for treatment, because the costs of transportation are a much lower proportion of the total costs for the disposal of wastes. This means facilities such as High Temperature Incinerators can treat waste from all over the UK.

Table 4 - Estimated waste processing costs (£ per tonne)

Landfill	
Solids Sludges	10-40
Contaminated soils	10-15
Bonded asbestos	50
Treatment	
Solvent recovery (clear acetone)	40-90/drum
Physico-chemical treatment	20-60
Stabilisation	30-50m^3
High Temperature Incineration	
Solids	350-900*
Liquids	0-250
Co-incineration	
Substitute Liquid Fuels (SLF)	20-28

Source: Environment Agency,2003

3.21 The wide range in the treatment costs for High Temperature Incinerators is caused by variations in issues such as markets, ease of handling, risks of handling, speed of processing and loading. The prices of treatment relate to the waste type and quantities.

3.22 Facilities to recycle floursecent tubes struggle to compete due to easy availability of landfill. There are currently two facilities in the UK where these can be recycled, but neither is in Hampshire. The recycling of batteries is expensive, and only UK plant in Avonmouth closed. Therefore batteries currently have to be processed in France.

3.23 Most large waste operators are put off investing in the infrastructure to take hazardous waste. Landfill engineering is expensive, particularly for hazardous waste landfills, and the treatment and acceptance criteria are uncertain. Furthermore landfill of hazardous waste results in the company taking on a long-term and unquantifiable liability. There is also a public image problem with the term “hazardous waste”.

3.24 The legal system in the UK causes problems for waste companies in contrast to the continent because it focuses on the precise meaning of particular phrases rather than looking at overall intention of the legislation. Typically problems arising from the interpretation of legislation are passed onto hazardous waste producers. Anecdotal evidence suggests that industry considers the interpretation of waste legislation by the government and Environment Agency to be more stringent than elsewhere in Europe.

3.25 The costs of disposing of hazardous waste are now sufficiently high that companies are trying to minimise their hazardous waste output and change their manufacturing processes. However, the costs of hazardous waste disposal in relation to other operating costs like salaries and accommodation means it is an issue which is unlikely ever to generate interest at board level.

3.26 **Codes of Practice**

3.27 Special Wastes: A technical guidance note on their definition and classification (Environment Agency et al)

3.28 Special Waste Explanatory Notes (SWENS): The Environment Agency have currently produced 71 SWEN’s focusing on types of special wastes including healthcare wastes, asbestos, household wastes, sewage sludge’s. The notes also cover other issues such as enforcement and movements of waste.

3.29 NetRegs guideance issued by the Environment Agency and Envirowise provide advice and to SME’s regarding wastes management.

3.30 Household Hazardous Waste Forum website provides useful information.

3.31 **Current Key players in Hampshire**

3.32 ***Shanks Chemical Services Ltd*** is one of Europe's largest independent waste management companies. Shanks offers a wide and often innovative range of waste management solutions within its various collection, transport, recycling, treatment and disposal services. The Group is one of the largest generators of electricity from landfill gas and produces a range of fuel-from-waste products. Shanks use thermal processes to process waste, recover energy and recycle valuable resources. Incineration services are offered through specialist waste treatment centres or by developing dedicated systems for their customers.

3.33 ***BIFFA Waste Services Ltd*** offers waste services to industry, commerce, retail customers and the health and public sectors. Its three operating divisions cover the spectrum from collection to sorting, recycling, treatment and ultimately disposal of non-hazardous and hazardous waste streams.

3.34 ***Cleansing Services Group (CSG)*** Ltd is a privately owned waste management company which specialises in the transfer, treatment and disposal of a number of different types of wastes including sewage, wastewater and oil water mixes.

3.35 ***Cleanaway*** is a major waste management organisation and can deal with specifically many elements of the hazardous waste stream. This includes solvents, hazardous solids and so on .

3.36 ***Onyx UK Ltd*** has major contracts with large hazardous waste producers, such as Esso (Fawley) and operates the KD Offshore facility at Marchwood, one of Hampshire's biggest hazardous waste treatment facilities. They are also a 50% shareholder in the Minosus underground storage facility. Their subsidiary company Hampshire Waste Services operates the Hampshire waste disposal contract as part of Project Integra.

3.37 ***A&B Oil*** recycle used and unused cooking oils to produce fuel.

3.38 ***BKP*** is an independent provider of environmental services offering a wide range of waste treatment solutions.

3.39 **Supporting Organisations:**

3.40 ***National Household Hazardous Waste Forum*** is a stakeholder-led initiative to seek practical solutions to the many problems associated with the management of household hazardous waste.

3.41 The ***Environment Agency*** regulates hazardous waste processing and disposal through various permitting systems controlling its transportation, processing and disposal.

3.42 ***Envirowise*** (Formerly the Environmental Technology Best Practice Programme (ETBPP)) is a government-funded programme offering free, independent advice on practical ways to minimise waste and increase profit.

3.43 ***Defra*** is the Government department with prime responsibility for waste and resource management, as well as other forms of environmental protection and the promotion of Sustainable development.

3.44 ***Chemical Industries Association*** is the chemical industry's leading trade association and employers' organisation representing member company interests both nationally and internationally. It seeks to represent the UK 's chemical and allied industries and support our members in achieving economic, social and environmental sustainability

3.45 ***DOENI*** is a division of the department of the environment which deals with the development of policy and legislation on the control of industrial emissions to air, land and water, and the assessment and management of ambient air quality, transboundary pollution and environmental noise.

3.46 ***DTI*** is the Government department responsible for encouraging growth and development of trade and industry in the UK. It aims to promote constructive co-operation between the regulated, the regulators and the UK's environmental technology suppliers who serve them.

3.47 ***Environmental Services Association*** is the trade body for the UK's waste management industry. ESA Members span the full spectrum of operations (including collection, treatment, disposal, recovery, recycling and re-use of waste), specialist equipment manufacturers and environmental consultancies, reflecting the increasingly sophisticated nature of the industry.

3.48 ***Oil Recycling Association*** (ORA) is a trade association that represents the interests of over 90% of the UK waste hydrocarbon oil collectors and processors.

3.49 ***The Construction Confederation*** are a representative body for contractors, representing some 5,000 companies who in turn are responsible for over 75% of the industry's turnover. The aim of the confederation is to achieve the best possible economic and political climate so that construction can thrive.

3.50 ***UK Petroleum Industry Association*** represents the interests of the UK industry on a range of common issues relating to refining, distribution and marketing of oil products.

3.51 ***ACORN (Associated Cooking Oil Reclaimers Nationwide)*** is a national body aim to promote the recycling of waste cooking oil.

3.52 **Examples of Current Best Practice:**

3.53 ACORN vehicle fuel scheme produces and markets biodiesel which provides an environmentally friendly and cheaper alternative to normal diesel by mixing the fuel with a small proportion of recovered waste cooking oils.

3.54 The duty on biodiesel has been set at 20p/litre below the standard rate since 2002. Duty on bioethanol is to be reduced to 20p/litre below the sulphur free duty rate from 1 January 2005 which will encourage their use as an alternative to virgin fuels and provide environmental benefits.

3.55 A&B Oil have been processing used catering oils to produce animal feed and are developing new markets for biodiesel. Biodiesel sales nationally have increased from almost nil in 2002 to around 2 million litres per month (The Budget, March 2004)

3.56 Secondary liquid fuels sold by Onyx from processing waste through the Marchwood Plant.

3.57 Envirowise offer free waste audits to companies and individuals to help them identify where unnecessary wastes are produced, and how they can reduce their disposal costs. This type of initiative is very helpful in reducing the quantities of hazardous waste produced, particularly if it is concentrated upon very large waste producers who may be able to make significant reductions in the levels of waste they produce.

Potential Hazardous and Chemical waste issues up to 2020

4.0 Future Data Required

4.1 The Environment Agency research into regional volumes and capacity needs which is expected to completed in June/July 2004 and needs to be added to future reviews.

4.2 The Environment Agency do not currently have the resources to provide on-line data so a national system to identify hazardous waste producers, and potential illegal disposal issues is not possible. The current system is paper based. However, major waste companies can act as a broker between disposers and people can use it (eg cement kilns).

4.3 Information from the EU sites catalogue needs to be further researched and included in future reviews.

4.3 Additional data on the total arisings and available disposal capacity for hazardous waste in Hampshire is required and should be included in future reviews.

4.4 **Future legislation**

4.5 Landfill (England and Wales) Regulations 2002 – Ban on Co-disposal of hazardous waste with other non-hazardous wastes in July 2004, is likely to lead to a significant reduction in available landfill void for hazardous wastes (landfill has traditionally been the major disposal pathway for this type of waste). This will almost certainly drive changes in the management of hazardous wastes, such as more minimisation, increased on-site treatment, re-classification of wastes, new storage, transfer and disposal facilities, pre-treatment of hazardous wastes, engineering of cells for the disposal of non-reactive hazardous wastes.

4.6 EU Waste Incineration Directive - Waste Incineration Directive will require upgrading of incinerators to meet new, more stringent, requirements although this is expected to have only minor implications for the incinerators in the County.

4.7 Waste Electrical and Electronic Equipment – waste electronic equipment will become hazardous waste and will be banned from landfill. The UK will have targets imposed on it for the recycling and recovery of these wastes.

4.8 HALON Directive (fire extinguisher propellants)

4.9 Reduction of Hazardous Substance (RoHS) Directive – this is complimentary to the WEEE Directive and will effectively reduce the use of hazardous substances in manufacturing.

4.10 Hazardous Waste Regulations – these will redefine, and expand, the list of wastes considered to be hazardous. They will make some wastes, such as Cathode Ray tubes etc hazardous whereas before they were considered to be non-hazardous.

4.11 Solvent Emissions Directive(SED)

4.12 Batteries Directive – will ban the landfilling of batteries

4.14 **Future Hazardous and Chemical Waste Arisings**

4.15 It has been assumed that waste minimisation initiatives will offset overall growth of waste in the hazardous and chemical waste stream. Waste minimisation initiatives can be effective with all hazardous wastes and has the potential to reduce the quantity and hazardousness of waste at low or even zero cost (Environment Agency,2003). Waste minimisation of between 5 and 10% is quoted as being achievable (Babtie,2000). The prices in the hazardous waste management market, combined with the overall impact of waste disposal on the economics of some of the producing sectors, has in the past made waste minimisation a low priority (Environment Agency,2003).

When costs rise as a result of the Landfill Directive, waste minimisation initiatives should be increasingly implemented to save money.

4.16 Waste minimisation is a key aspect of hazardous waste management and additional research into this area is required for future reviews of the strategy.

4.17 The major sources of hazardous waste in Hampshire by weight are waste oils (including oil and water mixes), hazardous construction and demolition waste (principally contaminated soils) and increasingly APC residues from thermal treatment. Finding solutions to ensure these wastes can continue to be adequately managed in the future is particularly important. However, some types of waste of which much lower quantities are generated can have extremely damaging environmental effects, and it is important that these small but significant components of the overall waste stream are not ignored. The Hazardous Waste Forum has identified priority waste streams where issues due to capacity shortfall are likely to be more acute. These priority waste streams are organic sludges and oily wastes, hazardous agricultural waste, waste mineral and fuel oils, hazardous construction and demolition waste, contaminated soils and air pollution control residues.

4.18 The level of waste oil and oil and water mixes generated in Hampshire is expected to remain static (stakeholder working group,2004). The quantities of waste mineral oil requiring disposal is declining at around 1% per year nationally due to the decline in heavy industry and the increased oil drain periods in vehicles (Environment Agency,2003). Of the 800,000 tonnes of lubricants used annually in the UK about 50% is thought to be recoverable, with the remainder lost in use (Environment Agency,2003). It is perceived by industry that the volumes of oil and water mixed wastes are relatively static, and are not likely to change in the foreseeable future, unless they are impacted by a fuel crisis. Limited incentives for oil recycling will increase the amount of oil entering the waste management system at the same time as reducing the number of disposal sites. Off site treatment options for oil (other than recycling) include blending to make cement kiln and power station fuels. Combustion in roadstone plants has historically been an option, but this is likely to cease as a result of forthcoming legislation. After Directive virgin fuel will be used more often, so waste oil will be primarily used for firing up coal fired power stations and cement kilns (Environment Agency,2003). Producers of recovered waste oils may in the future have to pay for it's disposal, whereas at present it has a positive value (Environment Agency,2003).

4.19 The level of hazardous construction and demolition waste (including astbestos) is expected to increase (stakeholder working group,2004). The most reliable way of forecasting the likely increases is to link growth the projections for future housing development (stakeholder working group,2004). The population of Hampshire (including Southampton and Portsmouth) is expected to rise by 11% from 1,682,000 in 2001 to 1,869,000 by 2021. (Hampshire Structure Plan (Review) 1996-2011). Therefore, the anticipated increases in the quantities of hazardous construction and demolition waste can be estimated as 5.5% by 2010 and 11% by 2020.

4.20 Efforts to recycle hazardous construction and demolition waste nationally are currently hampered by lack of markets, lack of on-site space to segregate potentially recyclable materials and time pressures during demolition projects (Environment Agency,2003). The Environment Agency is not forecasting the waste generated within the sector to increase on a national basis (Environment Agency,2003), although this is not considered applicable to the situation in Hampshire (stakeholder working group,2004). However, the Environment Agency anticipates that the amount of asbestos being removed from buildings and requiring disposal is likely to rise**.** Poundbottom landfill site, which is just over the County border in Wiltshire is the only local site applying for a permit to accept asbestos wastes.

4.21 An Energy from Waste plant for household waste has begun operating at Chineham near Basingstoke which incinerates 95,000 tpa of waste. Two further larger plants are being constructed at Marchwood and Portsmouth and are due to begin operating in 2004 and 2005 respectively. These plants produce a waste called Air Pollution Control (APC) residues which are classified as a hazardous waste. It is predicted that the following tonnages will be produced. Table 6 shows the projected waste quantities from this source arising from public sector EFW plants. Further data is required regarding projected arisings from other non-public sector sources.

Table 6- Projected Air Pollution Control arisings in Hampshire, Portsmouth and Southampton

APC residues from household waste incinerators	**arisings (tonnes per annum)**
2003	3 600
2004	6 900
2005	15 150
2006	16 800
2010	16 800
2020	16 800

Source: Onyx Hampshire Ltd,2004
Note: Includes only public sector EfW facilities.

4.20 A small decrease is expected in the quantities of organic chemicals arising in Hampshire. The Solvent Emissions Directive will reduce the levels of Volatile Organic Compounds (VOCs). Levels of organic solvents should drop over the period 2003-2007 (Environment Agency,2003). The amount of organic and inorganic chemicals nationally requiring disposal is expected to steadily increase and data provided by the CIA, via SoCSA indicates that levels of this type of hazardous waste nationally are increasing. However, the way in which these wastes are being processed is changing. Recycling by energy recovery or reprocessing accounted for 39% of national arisings in 2000, but rose to 52% in 2001. Waste minimisation initiatives are common throughout the industry and are likely to increase as costs increase.

4.22 Significant quantities of agricultural hazardous waste are generated by a number of small producers, this consists of items such as pesticide containers, chemicals (such as sheep dip) and animal carcasses. The National Farmers Union (NFU) believe that much of the solid waste is currently incinerated at the farm. This means that these wastes do not enter the general waste stream, and reliable information on the quantities is difficult to obtain. The agricultural sector also benefits from a significant number of exemptions from Waste Management Licensing, although these will be tightened up when future legislation is introduced. Such wastes are likely to have to require collection and disposal at a licensed facility in the future.

4.23 The proposed Hazardous Waste Regulations will change the definition of what is classed as hazardous waste, meaning the amount of hazardous waste produced nationally will probably increase by over two million tonnes a year. For example end-of-life vehicles, fluorescent tubes and pesticides will all become defined as hazardous waste. A contingency of 61,000 tonnes per year has been included in the forecast, however, the uncertainty of the Regulations currently mean this figure is likely to be unreliable and will require future revision. The contingency has been calculated on a per capita basis, on the assumption that the population of England and Wales is 52,480,000 and the population of Hampshire is 1,600,000.

4.24 There are likely to be increasing requirements for the separation of hazardous waste from the general household waste stream. There are plans to extend the numbers of Household Waste Recycling Centres accepting hazardous waste although quantities would be expected to be low. Based on the figures for the first year of operation, if hazardous waste were to have been collected at every HWRC instead of just nine in the pilot, then only about 14 tonnes would have been collected. If all hazardous waste were to be separated from the household waste stream, it would be expected that total arisings would be. There are no facilities in Hampshire for recycling fluorescent lighting, or batteries.

4.25 The quality of the data available makes prediction of future hazardous waste arisings problematic, particularly as the Regulations are in the process of revision, and there is much which remains uncertain at the current time. However based on the data available, and discussions with stakeholders and industry experts Table 5 represents the best estimate that the County Council was able to make. Regular monitoring and review will be required in the short to medium term to update the estimates based on experience.

Table 5- Projected Special Waste arisings in Hampshire, Portsmouth and Southampton

Type of Waste/Origin	Actual arisings (tonnes per annum) 2001	Estimated arisings (tonnes per annum) 2010	Estimated arisings (tonnes per annum) 2020
Oil, and Oil and Water Mixes	39 489*	39 500	39 500

C&D Waste and Asbestos	37 402*	39 500	41 500
Organic Chemical Processes	11 314*	11 000	11 000
Air Pollution Control Residues	3 600+	17 000	17 000
All others	12 086*	12 000	12 000
New hazardous wastes	0	61 000	61 000
TOTAL	**100 291**	**180 000**	**182 000**

* Source: Entec,2004
+ Source: Onyx Hampshire,2004

4.26 **Future Options for Resource Management**

4.27 There are a number of new technologies which are emerging as potentially useful ways to treat hazardous waste. These require further research and will need to be considered as the strategy is reviewed.

4.28 Contaminated soils can be excavated, treated and replaced on the site where they arise, however, the disposal of contaminated soils in suitable landfills is currently permitted and is exempt from landfill tax, and has been the favoured option historically. On site treatment of contaminated soils is often the cheapest and most sustainable management method. Bioremediation, soil washing and thermal treatment are all viable technologies, although PPC controls would make thermal treatment more expensive and problematic. However, on-site remediation relies on sufficient space being available, and in some cases could introduce unacceptable delays in enabling new developments to be built. It is likely that off-site soil remediation will be required in many cases and may be preferred where soils can be moved off-site for treatment to allow construction to start much sooner. These facilities would ideally be located on landfill sites, and soils treated to a standard where they were acceptable for use as daily cover, restoration or reuse. The infrastructure would pay for itself during the life of the landfill, and could therefore be a temporary facility. A 0.6 hectare site would be broadly sufficient to treat 35,000tpa (Shanks Group,.2004).

4.29 Waste treatment facilities are likely to come under the IPPC regime in 2006, increasing the operator's costs. The by-products of hazardous waste treatment vary depending on treatment type but include ash residues, filter cake, oily sludges and grits. These are presently disposed of to landfill, either with or without treatment, however, the opportunity exists to utilise the sludges as a fuel for energy recovery or to use the grits as a substitute raw material in cement manufacture such as in the Glacier ARM process. These options will become more favourable as landfill void for hazardous waste decreases. With regard to the KD Offshore plant, if waste heat from the adjacent Marchwood EfW could be utilised in the treatment process it may reduce costs for treatment and contribute towards reducing greenhouse gasses from energy production. The use of bacteria in the biological treatment of sludges can reduce sludge production and it is hoped that sludge production could be eliminated altogether by the use of such techniques.

4.30 As Hampshire moves towards the use of EfW incineration for municipal wastes there will be a growing need for the management and disposal of APC

residues. It is understood that similar wastes can be vitrified for re-use (Japan) or stabilised prior to landfill (France). It may be possible in the UK to use such wastes for acid neutralisation prior to long-term storage in the Minosus salt mine in Cheshire, or disposal to landfill without acid neutralisation. However, the environmental effects associated with the transportation of waste over long distances, coupled with increasing haulage costs due to fuel prices, means options to treat such wastes locally need to be considered.

4.31 The infrastructure required for the processing and disposal of hazardous waste is high cost, and inputs are comparatively low. For many types of hazardous waste, a regional, or even national approach to hazardous waste planning makes good economic sense because this allows wastes to be collected from a wider area and obtains high enough inputs to make processing facilities cost effective. Some types of hazardous waste may therefore have to be processed out of County, but bulking and transfer stations such as the CSG facility at Botley, will be required for stockpiling before onward transport to centralised facilities. A figure of two transfer stations of 20,000tpa capacity each would be adequate to meet this need (CSG,2004) although no data is available to support or refute this.

4.32 From July 2004, it is estimated that there may be as few as 10 landfill sites nationally which will be able to accept commercial hazardous waste, compared to over 240 in 2001. There are currently no sites within Hampshire which are either able to, or applying to be able to dispose of untreated hazardous waste. Furthermore, the Isle of Wight has no landfill facilities to dispose of hazardous waste after this date, although it is understood that a site is considering applying for a mono-cell to dispose of asbestos but this looks unlikely this will happen in the short-term. It is likely therefore, that all of the Isle Of Wight's hazardous wastes will need to be exported to the mainland, either into or through Hampshire. Referring to Table 2 which shows existing hazardous waste disposal routes in Hampshire. 13,000 tpa of hazardous waste (24% of the total managed in Hampshire) was landfilled. This disposal capacity will need to be replaced, or alternative treatment methods found.

4.33 The closest potential hazardous waste landfill sites to Hampshire (as of the 11 June 2004) are at Shepton Mallet in Somerset, Dartford in Kent and Swindon in Wiltshire. PPC applications for a site at Cheltenham is currently under consideration by the Environment Agency. It is currently being established for the sites in Swindon and Cheltenham whether the disposal of treated stabilised waste in non-hazardous landfills, by putting the waste into special segregated cells within the landfill would be acceptable. A study by the Environment Agency (Environment Agency,2003) states that there is a gap between hazardous waste treatment capacity available and hazardous waste produced which currently is met through co-disposal in landfill sites, this activity will stop on the 16 July 2004. The estimated national shortfall for 2004 is 2-4.8million tonnes per year (Environment Agency,2003).

4.34 All large players in the UK hazardous waste management sector have expressed concerns about its current state due to the management of and impacts associated with the Landfill Directive, a lack of definitive knowledge on treatment standards to be met, inconsistencies in regulation (creating an uneven playing field) and the length and time required to deliver new facilities under existing planning and IPPC controls (DEFRA,2002).

4.35 Urgent action is required to avert a major shortfall in capacity to dispose of hazardous waste safely. In Hampshire, it is likely that the biggest short-term issue is likely to be managing contaminated soils and asbestos (which will be banned from local landfills after July 2004) and making provision for the management of the small amounts of drummed waste, filter cake and similar hazardous wastes that are presently landfilled. This is likely to lead to storage problems, an increase in illegal disposal (including fly-tipping) and increasing public concern about the health and environmental impacts of hazardous waste facilities. Existing arrangements for APC residues and oil/water mixed wastes appear to be sufficient, however, there is some small risk that the existing disposal path for APC residues (Grundons at Bishop's Cleeve) may fail to be re-permitted for this waste type under the IPPC regime. More facilities for storing and treating these wastes local to Hampshire may be required.

4.36 Specialist recovery options (such as solvent recovery through evaporation and distillation) are increasingly likely to be introduced by large waste producers. Markets for merchant facilities are likely to be more stable where there is a concentration of smaller waste producers (Environment Agency,2003).

4.37 Co-disposal of hazardous waste with other waste in incinerators could be possible. This could be practiced on selected homogenous organic waste streams. However, this may lead to displacement of municipal waste unless excess capacity is provided.

4.38 Significant quantities of hazardous waste can be used as cement kiln fuel. The UK cement industry has been shrinking, but there has also been a shift away from coal as a kiln fuel towards waste derived fuels. In 2002 these made up 6% of the fuel input requirements in the UK, compared with a European average of 12%. Rates as high as 50% have been achieved in Belgium (Environment Agency,2003). The Environment Agency has proposed recently easing the restraints on this aspect. Recent figures quoted by the BCA (June 2004) quote current use of WDF at 8%, with maximums of 70% in Belgium. Table 7 shows the project quantities of wastes nationally that could be used as cement kiln fuel.

Table 7 Projected quantities of waste nationally that can be used as cement kiln fuel.

Fuel type	**2001** (estimate)	**2001** (actual)	**2002**	**2004-2007**
Waste-derived liquid fuels	110 000	83 502	98 345	200 000

Waste oils	0	0	0	90 000-345 000
Tyres	40 000	30 674	37 481	290 000
Paper, plastic, and packaging waste	0	0	7 890	500 000
Bone Meal, MBM	0	0	0	140 000
Processed Sewage Pellets, PSP	0	0	0	40 000
Total	**150 000**	**114 176**	**143 716**	**1 260 000**

(Source: British Cement Association, 2004)

4.39 The government may be taking a more proactive role in hazardous waste management through the setting up of WRAP and a move towards providing grants for capital schemes to stimulate investment in new facilities. Market forces will tend to deliver solutions towards the bottom of the waste management hierarchy because disposal costs are cheaper. For example, this has diverted solvents away from recovery processes to use in fuel for cement kilns. (Environment Agency,2003)

4.40 **Social Issues**

4.41 Hazardous household waste may need to be moved into hazardous waste stream if it is banned from disposal at non-hazardous landfills. Hazardous waste in the household stream is typically diluted amongst other household wastes and make up less than 1% of a typical bin. HWRCs in Hampshire are already starting to provide facilities to dispose of hazardous household waste at recycling centres. Increased public awareness and willingness to source separate hazardous waste may well be a issue which needs tacking in the future.

4.42 Envirowise offer free waste audits to companies and individuals to help them identify where unnecessary wastes are produced, and how they can reduce their disposal costs. This type of initiative is very helpful in reducing the quantities of hazardous waste produced, particularly if it is concentrated upon very large waste producers who may be able to make significant reductions in the levels of waste they produce.

4.43 The government also appear to be looking to pull back from the regulation of industry, and as a result this may lead to more illegal activity in relation to waste disposal, and it is important that this issue is addressed (stakeholder working group,2004)

4.44 **Environmental Issues**

4.45 Organised crime and unscrupulous companies may see illegal disposal has a business opportunity or a way to avoid treatment costs, and although it is not a current problem, increased expense may result in more fly-tipping of hazardous waste in the future. The Environment Agency need to ensure that offenders are prosecuted, and that information about legal disposal sites is readily available.

4.46 Until it becomes clear whether landfill of hazardous waste will be viable in the long-term, landfill operators are unlikely to accept such wastes at their sites.

4.47 People may not empty their oil interceptors as often due to cost, leading to more water pollution incidents.

4.48 **Economic Issues**

4.49 Although many types of hazardous wastes can be recycled or reused, this is a waste stream where minimisation of waste, if possible, is likely to be the key to resolving future problems. As the costs of disposal increase waste producers are likely to start looking at how they classify their wastes. There has been a historic tendency to be precautionary with regard to waste classification, this is likely to change as cost pressures hit home. Less may be classified as 'special' in the future because it might be sorted on site by a chemist due to costs of disposal.

4.50 Customers are price driven in the disposal and treatment of their waste, and this is the key factor that will determine which disposal methods prove most popular. This is particularly relevant to hazardous waste because the disposal costs are significant. Landfill is currently the cheapest disposal option for most hazardous waste types, but there will be very few hazardous waste landfills available in the future. The lack of local specialist hazardous waste landfills available once the new regulations come into force will mean that transportation costs for disposal will be much higher. Other disposal methods then become more competitive, if they can be supplied locally. Additional hazardous waste treatment facilities will be required, particularly bulking and transfer stations to allow more economic transportation of wastes to distant processing or disposal facilities. However, the risk that a new hazardous waste landfill site could be constructed in the region causing the demand for more expensive treatments to crash would represent a significant risk to businesses wanting to invest in new treatment infrastructure. High Landfill Tax is therefore a fundamental part of a successful hazardous waste management strategy.

4.51 The cost of disposal of hazardous waste is likely to rise significantly due to increased levels of regulation in the sector and the lack of future landfill capacity. Landfill tax and charging for registration and licensing are both likely to add significant additional costs for disposal of hazardous waste which is currently exempt from landfill tax. Landfill tax is £15 tonne as of 1 April 2004, and will rise £3 tonne per year thereafter to reach a medium to long-term anticipated rate of £35 tonne.

4.52 Tax Breaks when waste is used as a fuel in preference to primary sources under ROCS (Renewable Obligations Certificate Scheme) encourage the use of secondary fuels in industry. Reprocessing can produce saleable secondary fuels, which is financially and environmentally beneficial. Future changes to excise duty and/or product charges to need provide more of an incentive to regenerate waste oils.

4.53 High temperature hazardous waste incinerators have lost a lot of business to cement kilns, who burn waste as fuel. This makes good economic sense for hazardous waste producers because it is classed as recovery rather than disposal. There is increasing pressure on waste producers to move their waste further up the waste hierarchy.

4.54 Conversion of waste cooking oil to produce to animal feed for agriculture will be illegal from 1 November 2004, and has been illegal in mainland Europe since 2002. Markets will need to be developed for biodiesel, to provide an outlet for the fuels produced from recovery of vegetable oils, otherwise this industry is likely to become non viable.

4.55 The Oil Recovery Association considers waste mineral and fuel oil the largest liquid hazardous waste being handled by an industry historically characterised by low investment Good collection depends on getting recovered fuel oil to market at a competitive rate (ie lower than the cost of virgin fuel oils). There is concern that rising costs in this sector will lead to recovered fuel oil being used as cement kiln fuel at negative cost. Small oil collectors may get pushed out of the market. Recovered fuel oils currently have positive values and can be used for a range of options such as small scale oil burners in factories, start up fuel for power stations.

4.56 Future financial changes which should be sought from the government include using the landfill tax credit scheme to provide incentives for hazardous waste prevention and reduction; grants, low interest loans and enhanced capital allowances for investment in hazardous waste prevention and reduction schemes.

4.57 Hazardous wastes stay in the loop with the manufacturer. Customers 'lease' their solvents or whatever and return to manufacturer for recycling. Transport costs of this might be high. Producer responsibility may help with this problem too and avoid need to return to the manufacturer.

References

National Waste Strategy (DETR,2000)

Hazardous Waste – an action plan for its reduction and environmentally sound management (Hazardous Waste Forum,2003)

Hampshire Minerals and Waste Framework: Waste Forecasting Draft Interim Baseline Report (Entec,2004)

SWMA for South East 2000

Hazardous Waste Management Market Pressures and Opportunities: Background Paper (Environment Agency,2003).

Countdown to July 16th – The Strategic Implications for the Landfill Directive. Joint CIA/ESA Seminar

EFRA Select Committee on Hazardous Waste, July 200?

Entec Study on behalf of water industry (Client confidential)

The Implications of the Landfill Directive on the disposal of hazardous and liquid waste in the UK (Batbie, July 2003)

Towards Sustainable Agricultural Waste Management. Report produced on behalf of the Environment Agency by Marcus Hodges Environment 2001

Waste Not Want Not (Strategy Unit, Nov 2002)

Meetings

Bob Edwards – Cleansing Services Group – 23 March 2004
John Adams – Environment Agency – 16 April 2004
Ross Hilliard – Shanks Group – 27 April 2004
Lee Brunning – Onyx UK
David Ward – Hampshire County Council

Appendix 1 Hazardous and Chemical Waste

Issues/Opportunities (general)

- Infrastructure is urgently required to facilitate off-site treatment of contaminated soils.
- There is a lack of hazardous waste landfill facilities, due to ban on co-disposal from July 2004
- The increased use of energy from waste plants as a management method in the future will generate APC residues requiring disposal.
- There will be a growth in the capacity for cement kilns to use refuse derived fuel originating from the hazardous waste stream.
- Waste minimisation will have to be an important aspect in the future management of hazardous waste.

Proposed Actions (for MRS partners)

- Better data is required to be collected regarding both arisings and disposal routes for hazardous waste in Hampshire.
- Environment Agency should pursue a programme of support and education to assist producers of hazardous waste to reduce their arisings.
- Hazardous waste processing and treatment facilities suffer from a very poor image, and public perceptions of these types a facility need to be improved.
- A prioritised waste minimisation programme should be implemented

Proposed Policies (wording is indicative)

- Encourage waste minimisation.
- Encourage on site remediation of soils and the provision of off-site soil treatment facilities.
- Support projects that investigate new opportunities for the recycling and reuse of hazardous waste.
- Proposals for hazardous waste recycling facilities should be encouraged at sites which produce significant quantities of hazardous waste.

- Safeguarding of existing infrastructure as a contingency against the possible loss of the Shanks HTI due to competition from cement kilns.

Proposed Options

Option 1 (baseline)

The County has three recycling facilities that are able to treat and manage waste oils, and oil and water mixes, to produce fuel. These facilities are operating below their maximum capacities. The is also a plant at Southampton which is able to reprocess cooking oil to produce biofuels. There are no facilities for recycling other types of hazardous and chemical waste in the County, but of the waste exported 50% has been assumed to be recycled because of the availability of specialist facilities.

Percentage recycled – 31%. (Overall level of waste produced 5% more than under option 2)

Infrastructure Required – None

Cost – This has no cost to households and no cost for business.

Option 2

Retention of existing infrastructure, and construction of a new soil treatment facility of about 2ha in size.

Focussed waste minimisation advice to main producers of hazardous waste in Hampshire.

Recycling rate 43% (waste minimisation advice off-sets waste growth).

Infrastructure Required – Soil treatment facility about 2ha in size.

Cost – This is low cost to households (due to cost of providing advice on waste minimisation) and is low cost for business (due to construction of new soil treatment facility).

Option 3 (stretching best practice)

Retention of existing infrastructure, and construction of a new soil treatment facility of about 2ha in size.

Significant additional public resources to offer waste minimisation advice and assistance to all producers of hazardous waste (particularly SME's).

Percentage recycled – 43% (Waste minimisation advice results in 5% less waste being produced by 2020, than under option 2)

Infrastructure Required – Soil treatment facility about 2ha in size.

Cost – This is high cost to households (due to cost of providing advice on waste minimisation) and low cost for business (due to construction of new soil treatment facility) .

Scenario	Recycling	Infrastructure
Option 1 (baseline)	31%	No new infrastructure
Option 2	43%	Soil hospital for 35,000tpa (2 ha), located on a landfill site, or low quality land if possible
Option 3 (stretching best practice)	43%	Soil hospital for 35,000tpa (2ha), located on a landfill site, or low quality land if possible

Other options considered

A lot of hazardous waste is managed using end disposal options, and a lot is also managed out-of-County. End disposal options for hazardous waste are evaluated later in the MRS process.

Facilities for end disposal and transfer of hazardous waste in the County way be required. Need to address particularly organic solvents, APC residues and HTI sludges, and contaminated construction and demolition waste (other than soils).

The recycling figures stated rely on a number of arbitrary assumptions, which are:

Of the 27,000tpa of special waste is currently subject to other chemical/physical/biological treatment in Hampshire, 50% of the chemical/physical/biological treatments are recovery options, and 50% are disposal options.

Because of the large amount in inter-regional movements of hazardous wastes, it has been assumed that half of the waste treated or recycled in the County originates from with the County, and half from outside.

These assumptions give rise to a current recycling rate of 31% for hazardous wastes produced and recycled within the County.

Of the hazardous waste exported out of County it has been assumed that 50% is recycled, and that 50% is subject either to pre-treatment and then disposal, or direct disposal. The higher figure has been used because more

specialist facilities for hazardous waste recycling exist out-of-County to meet national and regional needs.

It has been assumed that out-of-County specialist hazardous waste recycling facilities will recover the same proportion of hazardous waste in 2020, as currently.

Of the wastes arising and treated within the County in 2020, it has been assumed that the same proportion of total waste arisings (ie. 31%) will continue to be recycled, except for options with soil treatment facilities, where the recycling rate for construction and demolition has been calculated separately, using the assumptions below.

50% of all the hazardous construction and demolition waste produced is assumed to be soil, and that the other 50% is assumed to be other hazardous wastes such as asbestos. 50% the contaminated soil arising in Hampshire is assumed to be recyclable, and the remaining 50% is assumed to be treated to a suitable standard to allow disposal in a non-hazardous landfill.

Appendix 2 MRS RESOURCE STREAM ANALYSIS

RESOURCE STREAM APPRAISAL

KEY FEATURES OF PREFERRED OPTION FOR HAZARDOUS AND CHEMICAL WASTE

Option Chosen – Stretching Best Practice

Arisings (tonnes per annum)

	2003		2010		2020	
	Household	C&I	Household	C&I	Household	C&I
Oils and oily wastes	-	39,486	-	39,500	-	39,500
Construction and demolition waste (non-soil)	0	18,701	0	19,750	0	20,750
Construction and demolition waste (soils)	0	18,701	0	19,750	0	20,750
APC residues	0	3,600	0	17,000	0	17,000
Organic Chemicals	-	11,314	0	11,000	0	11,000
All others*	9001	3088	9649	2351	10660	1340
New wastes	0	0	-	61000	-	61000
TOTAL	9001	94,890	9649	170,351	10,660	171,340

*Assumes1% of household waste is hazardous

Resource Recovery (tonnes per annum)

	2003		2010		2020	
	Househld	C&I	Househld	C&I	Househld	C&I
All hazardous waste Reuse	0	0	0	0	0	0
All hazardous waste Recycling	0	0	0	0	0	0
All hazardous waste Recovery	0	40,803	4149	73,251	4584	73,676
Unavoidable Waste	9001	54,087	5500	97,100	6076	97,664

Existing Infrastructure

Shanks Group High Temperature Incinerator at Marchwood, and oil treatment facilities at Romsey, Marchwood and Botley. e

Additional Infrastructure Requirements

Soil treatment facility about 2ha in size.

Collection Infrastructure Requirements

Societal Change Requirements

Significant additional public resources to offer waste minimisation advice and assistance to all producers of hazardous waste (particularly SME's).

Market Development / Initiatives

None

Cost

This is high cost to households (due to cost of providing advice on waste minimisation) and low cost for business (due to construction of new soil treatment facility) .

Government Action Required

None